1990
WYOMING MINERAL and ENERGY YEARBOOK

Department of Commerce
Economic & Community Development Division
Energy Section

WYOMING 1990
MINERAL and ENERGY YEARBOOK

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The Wyoming
Department of Commerce
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INTRODUCTION

The minerals industry is by far the largest single contributor to the economy of the State of Wyoming. 1990 valuation on minerals produced in 1989 was $3,772,814,316. This is 62% of the state's total valuation and placed Wyoming among the top ten mineral producing states in the nation.

This report outlines the distribution and status of the minerals industry in Wyoming during 1989. The primary mineral commodities produced in the state are reviewed individually and a section on historical mineral production is included in the Yearbook. This section enumerates yearly production figures for the state's primary mineral commodities: bentonite, coal, natural gas, petroleum, trona and uranium, from their first commercial development to 1989. The production projections for the next five years give an indication of predicted growth or decline of a particular mineral commodity in both the state and individual counties. Estimates beyond five years are not made because of increasing difficulty in making accurate predictions due to changing economic factors, governmental regulations, decreasing reserves and international developments.

The narrative sections provide an overview of the minerals produced in the state and the status of each county's mineral industry.

The reader desiring more detailed information on the location of various projects or resources is referred to the Oil and Gas Map of Wyoming and the Mines and Minerals Map of Wyoming and the Construction Materials Map available from the Geological Survey of Wyoming and the EDSD Mineral Development Monitoring System.

Graphs of county mineral valuation were prepared for those counties where minerals accounted for at least 25% of the total assessed valuation.

Production figures in this Yearbook are net or taxable figures and do not include federal or state royalty production because it is not included in the assessed valuation. Appreciation is extended to the mineral companies of Wyoming for their assistance and cooperation in providing estimates of production during the next five years.

Data on energy production and consumption has been increased in this edition, and additional coverage will be devoted to these topics in the future

Help and information provided by Don Bright, Ken Uhrich, Jim Felton and Rocky Hopson of the Ad Valorem Tax Division of the State Department of Revenue and Taxation proved invaluable. Special thanks are extended to Gary Glass and his staff of the Geological Survey of Wyoming, and Mary Byrnes of Research and Statistics for assistance in estimating future production levels. Jon Jacquot of the Wyoming Public Service Commission provided information and assistance in compiling energy consumption statistics.

Special thanks are due to Ed Maycumber, Energy Division Administrator, for many helpful suggestions and assistance in manuscript preparation. Also, Mr. Rick Coppinger of Electronics Unlimited provided invaluable help, advice, and encouragement in this undertaking.

Any questions or comments may be addressed to:

Department of Commerce
Rural and Economic Development Division
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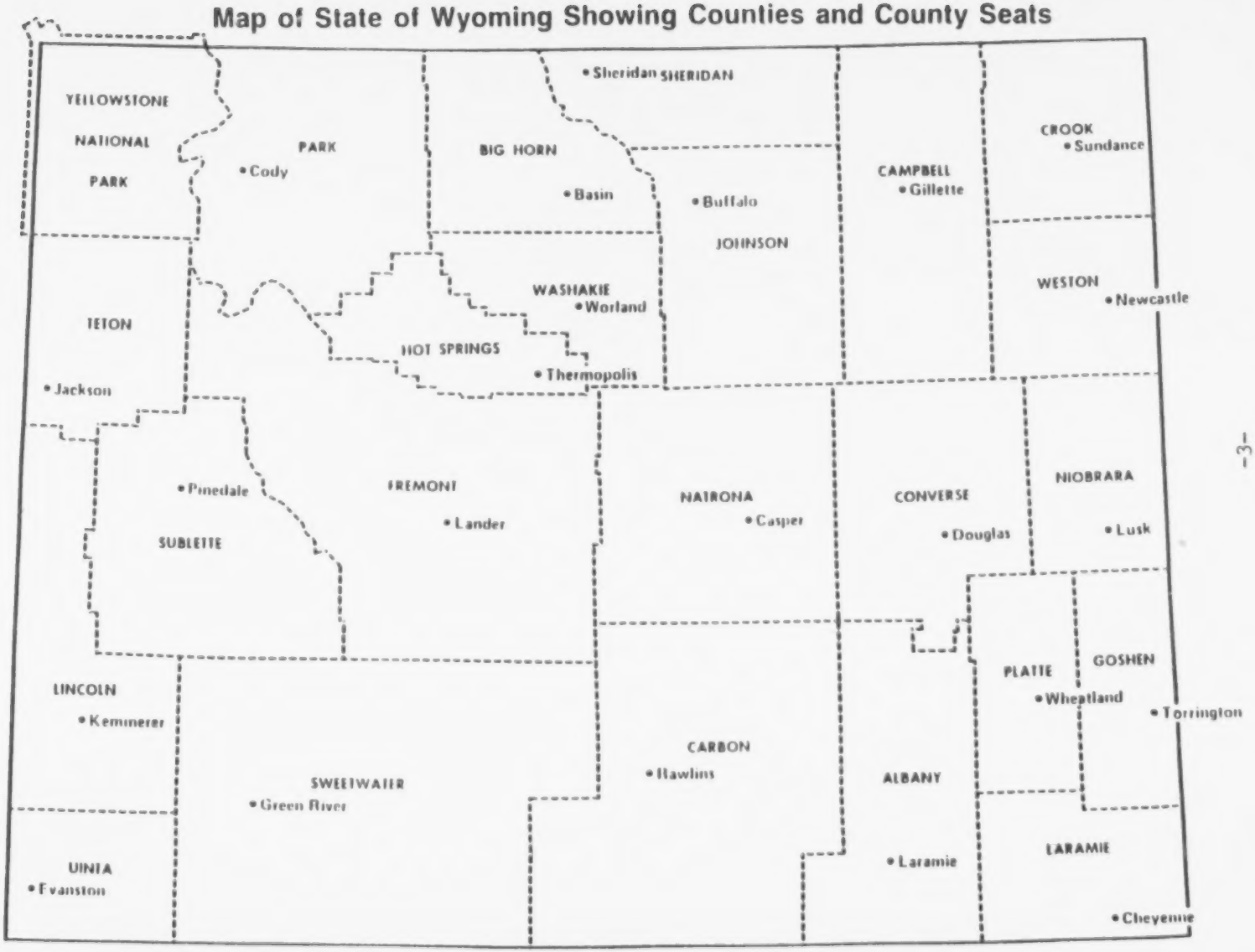
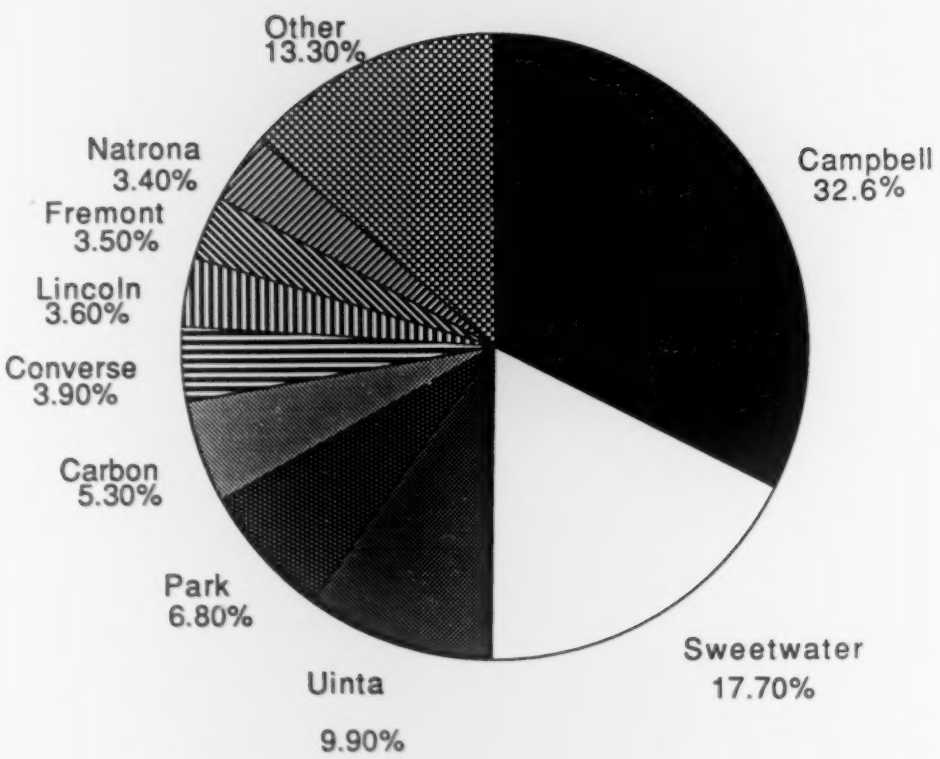
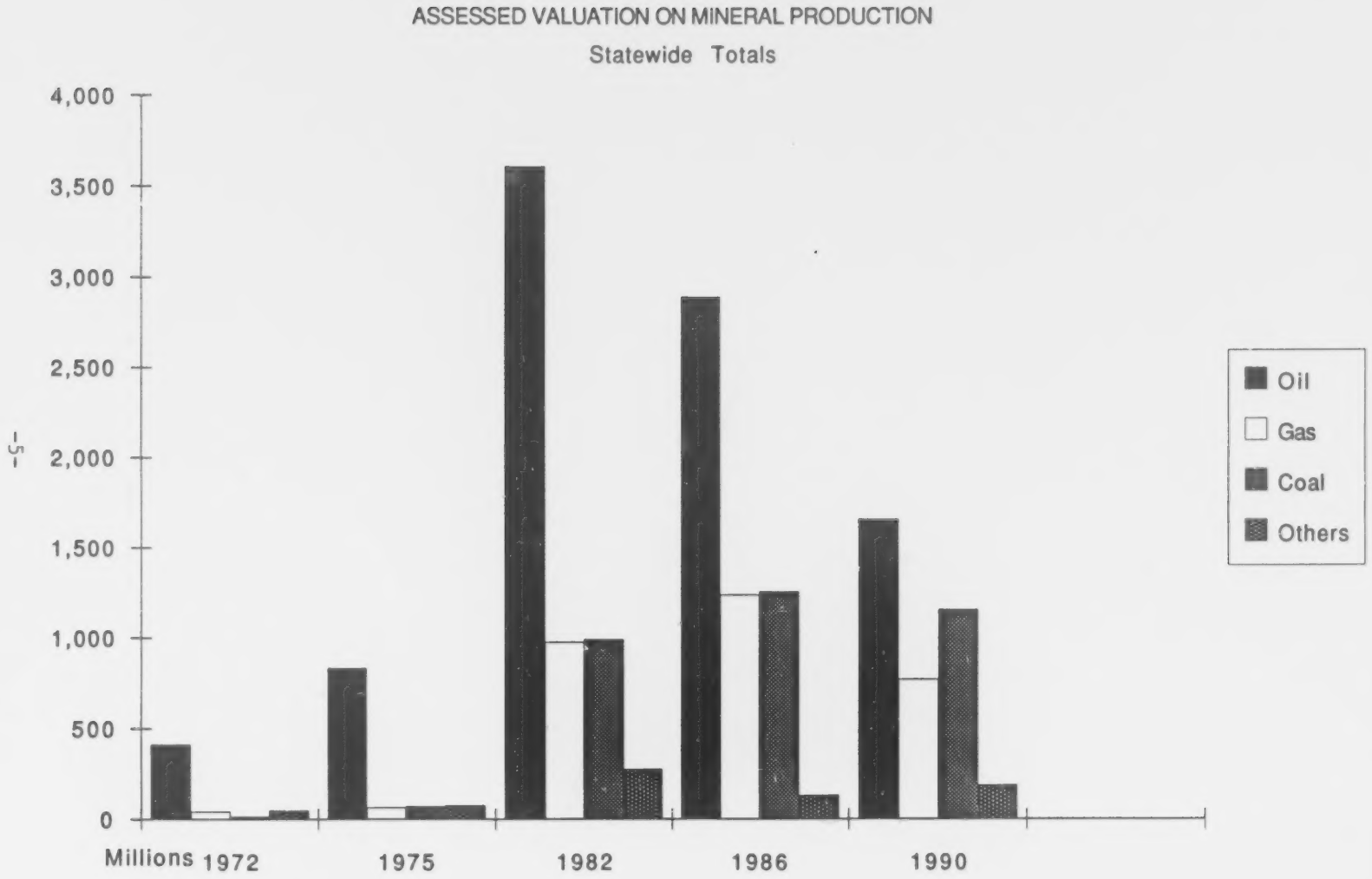
Cheyenne, Wyoming 82002

Map of State of Wyoming Showing Counties and County Seats



Total State Mineral Valuation= $3,772,814,316




ASSESSED VALUATION ON MINERAL PRODUCTION
Statewide Totals
4,000
3,500
3,000
2,500
2,000
1,500
1,000
500
0
Millions
1972
1975
1982
1986
1990
Oil
Gas
Coal
Others

WYOMING MINERAL INDUSTRY

TAX TABLES

The nine tables in this section illustrate the tax situation for the Wyoming Minerals Industry since 1969. The significance of 1969 is that it was the year the severance tax on minerals was initiated.

Tables are as follows:

I Assessed Valuation on Production, 1969 - 1990
II Ad Valorem Tax Paid on Production, 1969 - 1990
III Assessed Valuation Per Unit of Production, 1969 - 1990
IV Severance Tax Collections, 1969 - 1990
V Severance Tax Rates, 1969 - 1990
VI Severance Tax Distribution, 1990
VII Sales and Use Tax - Fiscal Year
VIII Government Royalty
IX Mineral Income to the State, 1971 - 1990

TABLE I

ASSESSED VALUATION ON PRODUCTION
(In dollars)

	1975	1976	1977	1978	1979	1980	1981	1982
Oil	833,099,266	894,047,178	871,638,686	933,988,779	1,030,279,506	56,955,262	2,113,492,444	3,399,464,789
Oil (Stripper)	978,407,639		54,635,836	62,166,335	69,151,578	128,228,914	206,202,114	206,223,009
Gas	65,041,856	88,861,898	132,925,715	223,675,393	264,389,250	456,131,295	671,087,378	
Coal	70,658,473	124,656,316	182,641,777	299,778,223	408,906,655	572,648,542	773,633,734	978,407,639
Uranium	19,519,275	20,829,685	41,830,148	66,240,921	73,196,538	108,890,862	138,925,498	989,695,692
Others	23,009,044	26,252,467	29,872,572	33,404,356	35,025,749	1,893,010	41,828,458	147,417,617
Totals	1,044,865	1,198,926,296	1,375,149,102	1,697,914,143	1,960,744,172	2,543,038,316	4,026,165,628	5,852,764,024

	1983	1984	1985	1986	1987	1988	1989	1990
Oil	32,980,583,636	2,788,082,073	2,926,290,488	2,687,685,876	1,343,892,041	1,551,590,991	1,285,310,949	1,549,010
Oil (Stripper)	201,804,826	198,338,861	201,873,856	201,675,444	96,370,615	174,465,837	101,299,945	108,585,237
Gas	1,132,051,442	1,258,272,277	1,484,730,803	1,238,247,618	889,888,628	717,673,951	719,589,653	771,209,008
Coal	1,113,645,140	1,151,048,135	1,230,917,455	1,256,360,635	1,111,486,981	1,006,229,601	1,170,706,216	1,159,292,224
Uranium	45,555,994	50,837,054	21,750,901	16,916,156	18,0195,557	6,550,057	19,519,851	17,740,552
Trona	121,583,686	104,500,003	95,792,777	95,839,980	16,324,082	16,485,884	41,102,402	150,600,216
Totals	55,624,803,535	5,577,786,192	5,987,627,146	5,514,921,883	3,581,548,229	3,587,543,292	3,438,393,971	3,772,814,316

1 Assessed Valuation is on the previous year's production. Prepared by: Dale S. Hoffman

Source: Department of Revenue and Taxation, January 1991
Ad Valorem Tax Division

TABLE II

AD VALOREM TAX PAID ON PRODUCTION (Taxes paid on previous year's production)

(In dollars)

	1969	1970	1975	1976	1977	1978	1979	1980	1981
Oil	18,630,403	21,250,757	44,062,703	52,011,268	53,242,493	57,655,255	65,640,994	73,114,675	141,067,719
Oil (Stripper)					3,337,395	3,837,536	4,405,838	8,103,525	N/A
Gas	1,818,047	2,026,025	3,791,780	5,416,016	8,363,221	14,157,450	16,951,670	29,195,909	42,834,889
Coal	278,203	347,724	3,991,473	7,321,256	11,216,632	18,962,219	25,551,858	37,216,429	48,882,281
Uranium	745,436	800,216	1,181,988	1,268,260	2,661,655	4,322,847	4,948,183	4,599,360	5,407,377
Trona	439,181	627,674	2.390,070	2,089,771	4,239,604	5,898,724	5,698,082	7,783,519	10,095,716
Others	496,108	615,480	1,363,208	1,648,239	1,919,772	2,145,881	3,212,339	2,712,807	2,885,474
Totals 251,173,456	22,407,378	25,667,876	56,781,222	70,754,810	84,981,772	106,979,912	126,408,964	162,726,224	251,173,456

	1982	1983	1984	1985	1986	1987	1988	1989	1990
Oil	208,758,682	200,728,469	185,908,225	189,946,540	171,648,252	88,950,870	100,915,478	84,099,181	101,886,186
Oil (Stripper)	12,664,006	13,590,618	13,225,167	13,103,632	12,879,942	6 378,675	11,47,258	6,628,157	7,142,194
Gas	62,548,833	75,104,760	83,480,988	98,634,245	86,586,112	60,991,867	48,430,791	49,265,774	52,161,492
Coal	65,921,399	76,171,728	77,605,647	80,239,656	78,515,051	72,296,114	63,353,498	72,368,578	72,999,336
Uranium	4,881,942	2,931,559	3,313,587	1,343,692	1,142.136	1,193,510	436,646	1,170,886	1,180,066
Trona	10,416,529	8,721,198	7,630,590	7,186,374	8,080,328	9,280,652	8,915,1378	15,114,169	11,080,863
Others	3,154,581	1,991,685	1,794,882	3,345,662	3,333,096	2,175,133	1,075,954	1,649,860	1,242,406
Totals	368,345,972	379,240,017	372,959,086	393,652,409	362 184,917	239,091,688	234,475,503	231,201,357	247,692,543

Sources: Department of Revenue and Taxation, Ad Valorem Tax Division.

Prepared: Dale S. Hoffman

Petroleum Association of Wyoming.

January 1991

TABLE III

ASSESSED VALUATION PER UNIT OF PRODUCTION
(In dollars)

	1970	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984
Oil (bbl.)	2.80	6.71	7.41	7.51	7.81	8.74	10.50	20.32	32.26	29.45	26.91
Oil (stripper)[1]				(11.85)	(13.01)	(13.89)	(23.53)	N./A	(34.94)	(31.60)	(29.19)
Gas (mcf)	.15	.24	.36	.51	.82	.97	1.37	1.92	2.77	3.22	3.19
Coal (ton)	1.50	3.54	5.39	6.03	6.73	7.24	8.32	8.55	10.06	10.71	10.67
Uranium (ton)	7.90	8.53	7.61	12.66	16.62	13.27	12.57	15.13	16.89	21.69	16.67
Trona (ton)	2.91	4.74	6.00	7.00	7.70	8.00	9.25	11.43	12.51	12.07	9.91

	1985	1986	1987	1988	1989	1990	20 Year $ Inc.	20 Year % Inc.
Oil (bbl.)	26.56	23.33	12.90	15.17	13.35	15.33	12.70	483
Oil (stripper)[1]	28.41	25.26	13.84	16.32	- - . - -	16.27	- - -	- - -
Gas (mcf)	3.32	3.01	2.52	1.76	1.53	1.16	1.01	673
Coal (ton)	9.64	9.30	8.67	7.88	7.10	6.77	5.37	384
Uranium (ton)	13.31	30.96	79.44	26.83	13.54	11.52	6.05	190
Trona (ton)	8.73	8.94	8.86	9.22	7.74	9.29	7.01	307

1 Stripper wells (10 bbls. per day or less) pay 4%.

Sources: Department of Revenue and Taxation,
Ad Valorem Tax Division.
Petroleum Association of Wyoming

Prepared by: Dale S. Hoffman

January 1991

TABLE IV
SEVERANCE TAX COLLECTIONS1,2
(In dollars)

	1970	1975	1976	1977	1978	1979	1980	1981
Oil	3,934,661	32,689,133	34,781,276	35,958,264	38,602,d78	42,594,321	48,842,788	212,216,807
Gas	357,047	2,604,405	3,554,476	5,317,029	8,947,016	10,575,570	18,245,252	58,704,458
Coal	63,778	2,862,339	4,986,253	17,716,252	30,277,601	42,935,199	60,128,097	103,918,048
Uraniurn	128,838	390,395	416,594	2,300,658	3,643,251	4,025,810	3,810,974	4,248,171
Trona	107,922	1,341,517	1,771,150	3,388,234	4,326,307	4,388,664	5,988,997	8,107,969
Others	104,362	463,772	527,052	597,454	668,087	700,515	837,8595	995,164
Totals	4,696,608	40,315,561	46,034,800	65,277,891	86,465,140	105,219,989	137,853,967	388,190,617

	1982	1984	1985	1986	1987	1988	1989	1990
Oil	186,209,348	183,652,383	169,328,171	84,488,347	100,074,092	40,650,600	81,170,655	97,284,057
Gas	71,149,850	89,283,848	74,294,857	33,393,318	43,060,437	28,045,898	43,175,379	46,272,540
Coal	116,873,160	128,444,924	130,810,704	116,604,337	85,502,132	43,251,305	98,988,303	97,582,590
Uranium	2,426,365	1,196,300	930,389	991,076	360,253	129,905	1,073,592	709,622
Trona	6,780,896	5,258,603	5,326,199	5,806,148	5,300,083	2,878,861	6,430,520	8,283,012
Others	740,484	325,418	343,925	326,480	329,718	3,135,967	1,649,860	367,525
Totals	384,180,103	408,171,476	381,034,245	261,609,906	235,626,715	118,092,536	231,339,424	250,499,347

[1]Severance Tax is paid on previous year's production. Prepared by: Dale S. Hoffman

[2]Severance Tax will be paid quarterly starting in 1981. January 1991

Source: Department of Revenue and Taxation, Ad Valorern Tax Division, Petroleum Association of Wyoming.

TABLE V
SEVERANCE TAX RATES

	1969	1970	1976	1977	1978	1979	1980	1981
Oil	10 Mills (1%)	1.0%	4.0%	4.0%	4.0%	4.0%	4.0%	6.0%
Gas	10 Mills (1%)	1.0%	4.0%	4.0%	4.0%	4.0%	4.0%	6.0%
Coal	10 Mills (1%)	1.0%	4.4%	4.8%	9.7%	10.1%	10.5%	10.5%
Uranium	10 Mills (1%)	1.0%	2.0%	2.0%	5.5%	5.5%	5.5%	5.5%
Trona	10 Mills (1%)	1.0%	4.0%	4.0%	5.5%	5.5%	5.5%	5.5%
Others	10 Mills (1%)	1.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%

	1982	1983	1984	1985	1987	1988	1989	1990
Oil	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%
Gas	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%
Coal	10.5%	10.5%	10.5%	10.5% (surface) 7.25% (underground)	10.5% (surface) 7.25% (underground)	8.5% (surface) 5.25% (underground)*	8.5% (surface) 5.25% (underground)*	8.5% (surface) 5.25% (underground)*
Uranium	5.5%	5.5%	5.5%	5.5%	5.5%	5.5%	5.5%	5.5%
Trona	5.5%	5.5%	5.5%	5.5%	5.5%	5.5%	5.5%	5.5%
Others	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%

*Change made by 1984 Legislature

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January 1991

TABLE VI
SEVERANCE TAX DISTRIBUTION (1990)

Proceeds To	Coal*	Trona	Uranium	Oil*	Gas	Other
Permanent Wyoming Mineral Trust Fund	2.0%	1.5%	1.5%	1.667%	1.667%	
General Fund	2.0%	2.0%	2.0%	2.000%	2.000%	2.0%
Wyoming Water Development Account	1.5%			.167%	.167%	
Highway Fund	1.0%	0.9%	O.9%	.666%	.666%	
Capital Facilities Revenue Account	1.5%	0.6%	0.6%			
Counties				.250%	.250%	
Cities and Towns				.750%	.750%	
Worker's Compensation Diversion	.5%	.5%	.5%	.5%	.5%	
Total	10.5%	5.5%	5.5%	6.000%	6.000%	2.0%

#Stripper Oil is 4.0%.
~Underground coal is 7.25%

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TABLE VII SALES AND USE TAX (FISCAL YEAR)
(In dollars)

		1977	1978	1979	1980	1981	1982	1983
Oil and Natural Gas	Sales	4,837,746	6,803,898	8,581,968	12,348,619	16,079,610	22,035,697	15,218,668
	Use	494,689	663,220	1,270,079	1,659,281	2,037,239	7,313,596	3,523,80
Coal	Sales	238,357	318,052	463,133	519,766	841,075	734,329	559,87
	Use	1,441,992	1,451,495	2,327,323	1,177,761	930,267	2,747,266	3,351,32
Metal Mining	Sales	187,762	191,480	573,470	191,266	152,566	244,464	262,15
	Use	868,173	1,171,804	1,218,530	957,484	566,053	325,782	179,11
Other Mining	Sales	459,592	734,697	1,231,801	1,561,663	2,135,082	2,801,968	1,816,543
	Use	1,425,173	1,330,654	1,415,269	1,705,501	2,035,418	1,829,396	1,940,381
Totals	Sales	5,723,457	8,075,098	10,850,372	14,621,314	19,208,333	25,816,458	17,857,242
	Use	4,230,027	4,850,379	5,231,201	5,500,027	5,568,977	12,216,040	8,994,625
	Both	9,953,484	12,925,477	16,081,573	20,121,341	24,777,310	38,032,498	26,851,867

		1984	1986	1987	1988	1989	1990
Oil and Natural Gas	Sales	13,361,873	9,845,347	982,608	6,210,534	5,511,945	6,990,322
	Use	3,205,904	17,220,121	69,947	1,287,855	1,419,940	2,509,583
Coal	Sales	504,977	1,163,794	959,208	1,519,090	1,895,638	1,938,520
	Use	4,620,216	3,132,693	2,138,937	3,602,674	4,760,566	6,730,806
Metal Mining	Sales	3,737	240,414	8,572	566,683	892,842	569,540
	Use	223,504	448,884	0	268,296	55,125	74,368
Other Mining	Sales	1,220,018	964,348	3,907	0	224,783	179,846
	Use	1,201,420	1,088,222	4	7,029,472	7,426,549	1,444,916
Totals	Sales	15,090,605	12,213,903	1,954,295	8,296,307	8,525,208	9,678,228
	Use	9,251,044	21,889,920	2,208,888	12,320,382	13,530,095	10,760,673
	Both	24,341,649	34,103,823	4,163,183	20,616,689	22,055,303	20,438,901

Source: Department of Revenue and Taxation

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January 1991

TABLE VIII
GOVERNMENT ROYALTY (MINERAL ROYALTY RETURNS TO STATE)
(In dollars)

1970	1975	1976	1977	1978	1979	1980	1981	1983
18,624,702	34,450,233	49,433,822	58,971,484	69,763,079	76,523,544	95,100,847	115,062,289	152,195,146

1984	1985	1986	1987	1988	1989	1990
165,092,468*	221,650,911**	188,467,235	131,804,697	160,262,662	176,174,585	201,154,510

Prior to 7/1/76 the State received 371/2% of the Federal Mineral Royalties, after 7/1/76 the State received 50%. These funds are distributed by W. S. Section 9-4-601 as follows:

Foundation Program	Highway Commission Counties	University of Wyoming	Highway Cornmission for Districts	Incorporated Cities & Towns	Capitol Construction Cities, Towns, Special
34 1/2%	26 1/4%	6 3/4%	2 1/4%	7 1/2%	7 1/2%

Capitol Construction Schools, Community Colleges and State
15 1/4%

Source: State Treasurer.

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January 1991

* The percentages above reflect the changes rnade by the 1984 legislature.
**Amount is inflated due to carry over when reporting changed to quarterly rather than fiscally.

TABLE IX

MINERAL INCOME TO THE STATE OF WYOMING 1971 - 1990

(In dollars per calendar year)

Source	1977	1978	1979	1980	1981	1982	1983	1984
Ad Valorem	84,981,772	106,979,912	126,408,964	162,726,224	251,173,456	368,345,972	379,240,017	372,959,086
Severance	65,277,091	86,465,140	105,219,989	137,853,969	388,190,167	384,180,103	381,418,027	408,171,476
Sales and Use1	9,953,382	12,925,477	18,987,778	20,121,341	24,777,310	38,032,499	26,851,867	24,341,649
U.S. Rent and Royalty Returns*	58,971,484	69,763,078	76,523,544	95,100,847	115,062,289	119,955,519	152,195,146	165,092,468
State Rent	3,532,586	3,946,697	3,504,505	4,716,653	5,487,607	6,358,149	6,547,641	5,649,863
State Royalties	15,254,011	15,560,977	16,248,479	30,814,994	51,011,313	62,113,790	64,615,059	56,726,182
General Fund Income (filing fees, etc.)	4,032,739	6,433,216	6,408,160	7,608,030	9,143,841	15,350,121	13,240,427	10,976,503
Total	1240,903,865	302,074,497	353,301,419	458,942,058	646,515,667	994,336,153	1,024,108,184	1,093,917,227

	1985	1986	1987	1988	1989	1990
Ad Valorem	393,652,409	362,184,917	239,091,688	234,475,503	231,201,357	247,692,543
Severance	381,034,245	261,609,906	235,626,715	118,092,5362	231,339,424	250,499,347
Sales and Use1	22,759,014	34,103,823	4,163,183	20,616,689	22,055,303	20,438,901
U.S. Rent and Royalty Returns	221,650,911	188,467,235	131,804,697	160,262,662	176,174,585	201,154,510
State Rent	12,261,674	6,713,567	2,333,149	2,101,286	1,845,295	1,868,973
State Royalties	59,142,728	54,222,959	30,052,219	36,107,357	31,803,256	33,257,548
Ceneral Fund Income (filing fees, etc.)	3,716,017	2,052,011	406,541	147,753	110,288	76,704
Total	1,093,889,998	6,304,618	641,448,192	571,803,786	694,529,508	754,988,526

*Prior to 7/1/76 the State received 37.5% of the Federal Mineral Royalties, after 7/1/76 the State received 50%.

Prepared by: The Geological Survey of Wyoming.

Sources: Economic Development and Stabilization Board, Department of Rerenue and Taxation, State Land Commission, and State Treasurer. November 1987

Prepared by: Dale S. Hoffman January 1990

1This only includes Metal Mining, Coal Mining, Miscellaneous Mining and Oil and. Gas.

WYOMING MINERAL COMMODITIES REVIEW
1990

BENTONITE

Bentonite is a clay mineral which is the result of the alteration of volcanic ash. Wyoming bentonite originated from volcanic ash ejected in western Wyoming and Idaho during the late Cretaceous period about 120,000,000 years ago. Prevailing westerly winds blew the ash eastward and deposited it in the areas now occupied by bentonite deposits. Wyoming bentonite occurs in the Big Horn Basin, the southern Powder River Basin, and along the western edge of the Black Hills in the northeastern corner of the state.

Bentonite is a clay mineral composed of microscopic platelets consisting of layers of aluminum hydroxide held between layers of silicate atoms. These platelets are stacked one on top of the other. Water can penetrate between layers of platelets, causing the entire structure to swell. Wyoming bentonite has sodium atoms interspersed between these layers of platelets at intervals. Other types of bentonite have calcium between the platelet layers. Sodium bentonite has greatly increased swelling characteristics. Wyoming sodium bentonite, when wet, increases as much as fifteen times its original volume.

Bentonite was used by area Indians as a bleaching clay and washing agent before the white man ventured into what is now Wyoming. Bentonite bogs or "soap holes" caused the loss of some cattle to pioneers, but it was utilized as an emergency substitute for axle grease, as a curative pack for inflamed horses' hoofs and as waterproofing for the roofs of dwellings.

Bentonite was originally named taylorite for William Taylor of Rock Creek, who first made commercial shipments of the clay in 1888. Dr. S. H. "Sam" Knight, State Geologist of Wyoming, renamed the clay bentonite when he learned that taylorite had previously been used in England as the name for another mineral. The term bentonite comes from the Fort Benton shale member of the Mowry formation, where the mineral occurs.

The first sales of Wyoming bentonite were to eastern plants for use in the manufacture of cosmetics. Production remained at a low level until the 1920's, when bentonite's usefulness as a binding agent in foundry sand and as an additive to oil well drilling mud were first discovered.

The U. S. Bureau of Mines economic mineral publications first separated bentonite from "other clays" in 1931. The Wyoming Ad Valorem Tax Division has maintained separate bentonite production statistics since 1927.

The first bentonite mill in Wyoming was constructed at Cheyenne in 1920.
The bentonite used in this plant was mined near Medicine Bow. The first mills near the Black Hills, in the northeastern part of the state, were constructed at Newcastle, Osage, and Upton in 1926. Production began in the northern Black Hills near Belle Fourche in the late 1930's. Later, other high grade deposits were discovered in the Big Horn Basin and the Kaycee area of the Power River Basin.

Wyoming bentonite production has risen from 1,141 tons in 1927 to 2,211,252 tons in 1989. The accompanying table shows historical Wyoming bentonite production.

Estimates of remaining Wyoming bentonite reserves vary widely. A report of the American Institute of Mining Engineers gives a figure of 1,140,000,000 tons of in-place reserves, while the 1980 edition of the U. S. Bureau of Mines Minerals Facts and Problems lists reserves of 200,000,000 tons.

Bentonite deposits either crop out at the surface or are buried shallowly, so mining operations consist of removing any overburden present and loading the bentonite into trucks for transport to a mill. Due to shallow burial and the loose unconsolidated nature of the surrounding sediments, no underground mining of bentonite has been attempted. When the bentonite arrives at the mill, it is segregated into piles according to physical characteristics. Materials from these piles are blended to obtain a product with the desired characteristics.

In the mill, the bentonite is first broken into small chunks, screened, and conveyed through a dryer. Temperature of the dryer is critical since temperatures that are too high can destroy the desired properties of the bentonite. Natural gas has been the fuel used in the dryers, but coal and some air drying are now utilized in several operations.

Drying removes about 25% of the moisture in the bentonite. After drying, the clay is pulverized to a variety of size ranges. After sizing, bentonite is either packed in 50, 75, or 100 pound bags or bulk shipped in covered railroad cars.

Currently, the single largest market for bentonite is the oil and gas industry, which uses bentonite as a drilling mud additive. Fifty

percent of Wyoming bentonite is used in drilling muds. Bentonite's colloidal properties allow heavy well cuttings to be suspended, helps lubricate drilling equipment, cakes the sides of the drill hole to prevent caving, and prevents seeping of ground water into the hole and drilling fluids out of it into surrounding rocks.

The foundry industry consumes 20% of the state's bentonite. Bentonite is used as a molding sand binder. The clay's superior binding properties allow the sand to be formed into shapes that will not fracture or disintegrate during molding operations.

Iron ore pelletizing has used 20% of the bentonite produced. However, it appears that an organic binder may take over this application.

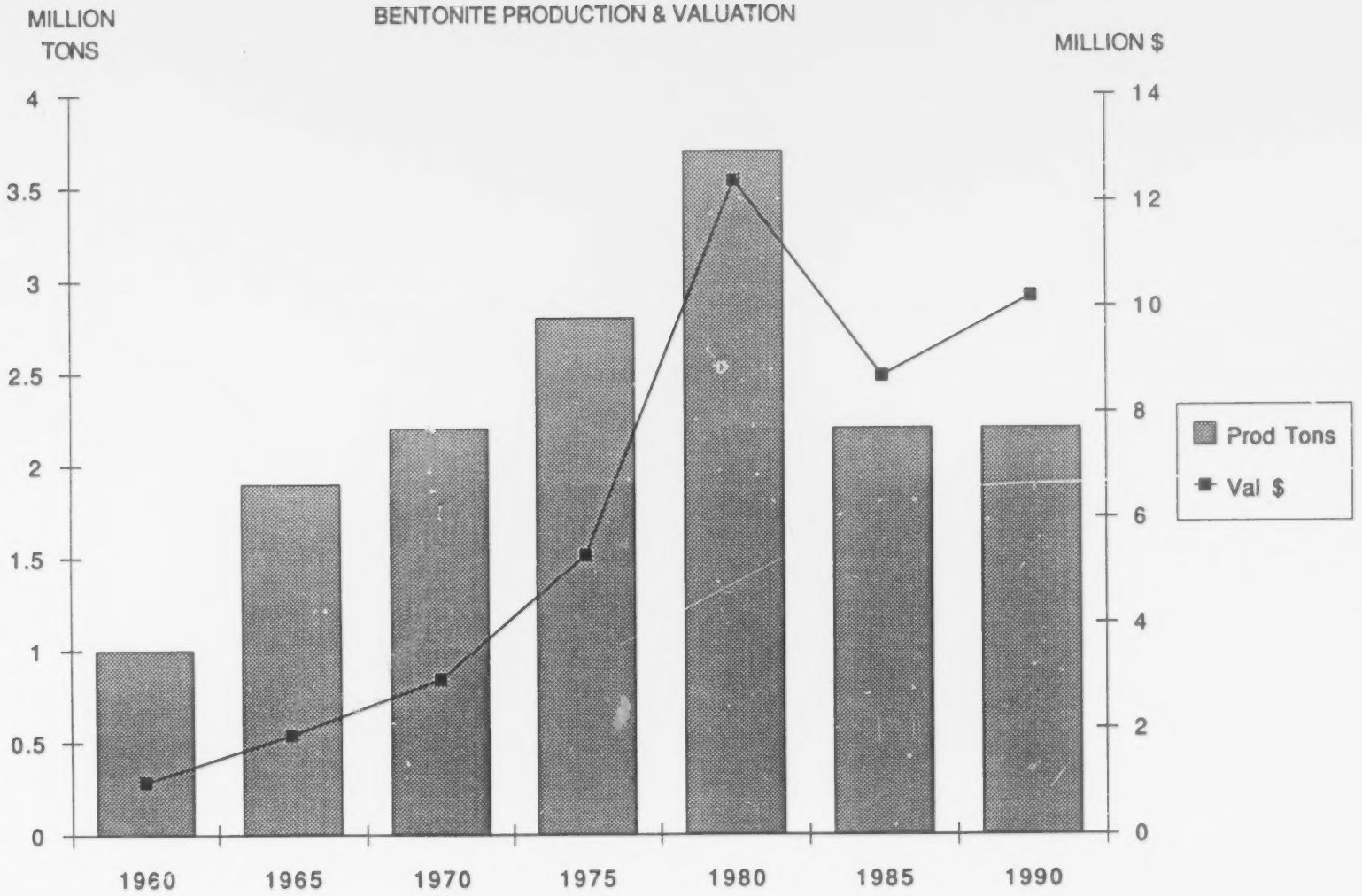
The remaining 10% is used in a myriad of applications, a sampling of which are: animal feed, ceramics, water softening, cement manufacture, laxatives, crayons, paint, insecticide, reservoir liner, and medicines.

Long range prospects are favorable, but bentonite production will probably flucuate in the near term, as it did this year. New applications such as lining disposal ponds will improve the market, but the bentonite industry will still basically trace the fortunes of the oil and gas drilling industry.

HISTORICAL BENTONITE PRODUCTION

Year	Net Tons	Year	Net Tons
1921 - 1926	Lumped with "other clay"		
1927	1,141	1957	1,073,119
1928	11,097	1958	648,404
1929	23,369	1959	1,146,001
1930	25,900	1960	1,096,850
1931	14,307	1961	1,008,756
1932	11,906	1962	1,165,538
1933	21,652	1963	1,398,106
1934	27,177	1964	1,578,528
1935	40,154	1965	1,923,319
1936	36,926	1966	2,081,352
1937	61,686	1967	1,801,966
1938	65,289	1968	2,118,871
1939	77,481	1969	2,373,253
1940	70,265	1970	2,228,978
1941	182,719	1971	1,813,066
1942	201,424	1972	2,062,384
1943	273,095	1973	2,614,779
1944	347,048	1974	3,422,675
1945	535,675	1975	2,760,871
1946	324,886	1976	3,278,765
1947	617,940	1977	3,315,783
1948	713,802	1978	3,626,652
1949	607,767	1979	4,479,242
1950	543,274	1980	3,584,713
1951	926,850	1981	4,805,005
1952	926,850	1982	2,345,914
1953	949,566	1983	2,183,865
1954	928,837	1984	3,083,324
1955	886,092	1985	2,588,229
1956	1,215,946	1986	1,818,502
		1987	2,159,077
		1988	2,328,182
		1989	2,211,252
		Cumulative Total	87,765,976

Source: Wyoming Department of Revenue and Taxation (net taxable tons)


BENTONITE PRODUCTION & VALUATION
MILLION TONS
MILLION $
4
3.5
3
2.5
2
1.5
1
0.5
0
14
12
10
8
6
4
2
0
1960
1965
1970
1975
1980
1985
1990
Prod Tons
Val $

COAL

Coal results from the burial and compression of large amounts of vegetation. Increasing depth of burial results in the addition of heat which alters the original vegetation physically and chemically.

Wyoming's coal deposits accumulated during two geologic periods, the later Cretaceous and Early Tertiary, between 75 and 45 million years ago.

During late Cretaceous time, Wyoming was a low land area, periodically covered by a shallow sea which advanced and retreated from east to west. When the sea retreated, low lying coastal swamps developed where extensive vegetation grew, died and accumulated on the swamp bottoms. When the sea readvanced, the plant material was buried by silts and clays. This cycle was repeated many times, with the earlier deposited material being buried deeper and deeper and ultimately being converted into coal by heat and pressure.

Wyoming's Cretaceous coals are commonly thin, seldom exceeding 10 feet in thickness.

Conditions were different in early Tertiary Time, when the other sequence of Wyoming coals developed. The sea had disappeared, and various ranges of the Rocky Mountains had risen. A number of basins developed between these ranges, and large amounts of vegetation accumulated in these basins. These Tertiary coals are typically much thicker then the earlier deposits, with beds of 30 to 100 feet common, and a maximum known thickness of over 200 feet.

Coals are ranked according to composition and heating value. Peat, which consists of lightly compressed dried vegetation, is not considered a coal, although it is used as a fuel in Ireland and northern England. The ranks of coal are as follows:

Name	Amount of Carbon	BTU Content	Volatiles	Moisture
Anthracite	86 - 98%	16,000 - 20,000	5%	0%
Bituminous	55 - 85%	11,000 - 16,000	25%	20%
Subbituminous	30 - 55%	8,300 - 11,000	40%	30%
Lignite	10 - 30%	4,000 - 8,300	50%	40%

These ranks are divided into smaller categories in detailed classifications. Wyoming's coal is subbituminous in grade. It

contains more moisture and less sulphur than many equivalent coals from the east and midwest.

The first written account of coal in Wyoming was made in 1843 by Captain John C. Fremont, "The Pathfinder". He referred to the appearance of coal in what was probably Cumberland Gap, near Kemmerer.

Captain John R. Stansbury, U. S. Army Corp of Engineers, reported seeing large outcrops of coal near Rock Springs and at Point of Rocks, twenty-five miles east of Rock Springs, in 1852.

The first use of Wyoming coal was made by the Army to heat winter quarters and in stage line forges in the mid-1800's.

The Union Pacific Railroad began prospecting for coal along its line in Wyoming in 1867, and the first coal mined by the railroad was 650 tons taken at the now abandoned Town of Carbon in 1868.

In 1908, forty years after the first production, coal mining was the leading industry in Wyoming, with a production of over six million tons, one third of it from the Rock Springs area.

The Kemmerer Coal Company opened mines near Kemmerer about the turn of the century, and Kemmerer Coal is still operating at the present time, the longest continuous operation in the state.

Production increased up to 1947, when eight million tons were produced in the state, mostly from mines in the Hanna, Rock Springs, and Sheridan areas.

It was at this point that the railroads began the change from steam to diesel locomotives, and as demand for railroad coal decreased, Wyoming production followed it downward. The bottom was reached in 1959 when the state produced less than two million tons.

Beginning in the mid-1960's, interest in Wyoming coal, as a fuel for thermal electric generation plants began to increase. This interest was sparked primarily by two factors, physical properties of the coal, and its cost. The physical property of Wyoming coal, which made it attractive to power plant operators, was its low sulphur content, which ranges between 0.5 and 1.5 percent sulphur. This constrasts with eastern coals which range from 5 to 9 percent sulphur. The ability to burn Wyoming coal without installation of expensive exhaust gas scrubbers more than compensated for other detrimental properties, namely low heat value and high water content.

Because virtually all Wyoming coal was strip mined, its cost of production was much less than deep mined eastern coal. In addition,

large machinery and the latest technology greatly increased worker productivity, which lowered the price further.

There are 29 active Wyoming coal mines; 27 surface and 2 underground operations. These mines are concentrated in only a few areas: the Hams Fork Coal Region in Lincoln County; the Rock Springs Coal Region in Sweetwater County; the Hanna Coal Field in Carbon County; the Powder River Coal Region in Converse, Campbell, and Sheridan Counties; and one mine in the Big Horn Coal Field of Hot Springs County.

The Powder River Basin accounts for 88% of Wyoming's production and boasts the three biggest surface coal mines in the nation: Amax's Belle Ayre Mine, Kerr-McGee's Jacob's Ranch Mine, and Atlantic Richfield's Black Thunder Mine.

Seven new states used Wyoming coal in 1989: Georgia, Ohio, New Hampshire, Alabama, Mississippi, Kentucky, and North Dakota. These purchases reflect small quantities obtained for test burn purposes.

Information on individual mines is available from the State Geological Survey in Laramie or the Wyoming Mine Inspector.

Wyoming coal production has increased over 22 fold since 1971 under the impetus of power plant demand. A new production record of 171,038,369 tons was set last year.

The history of Wyoming coal production is given on the accompanying table.

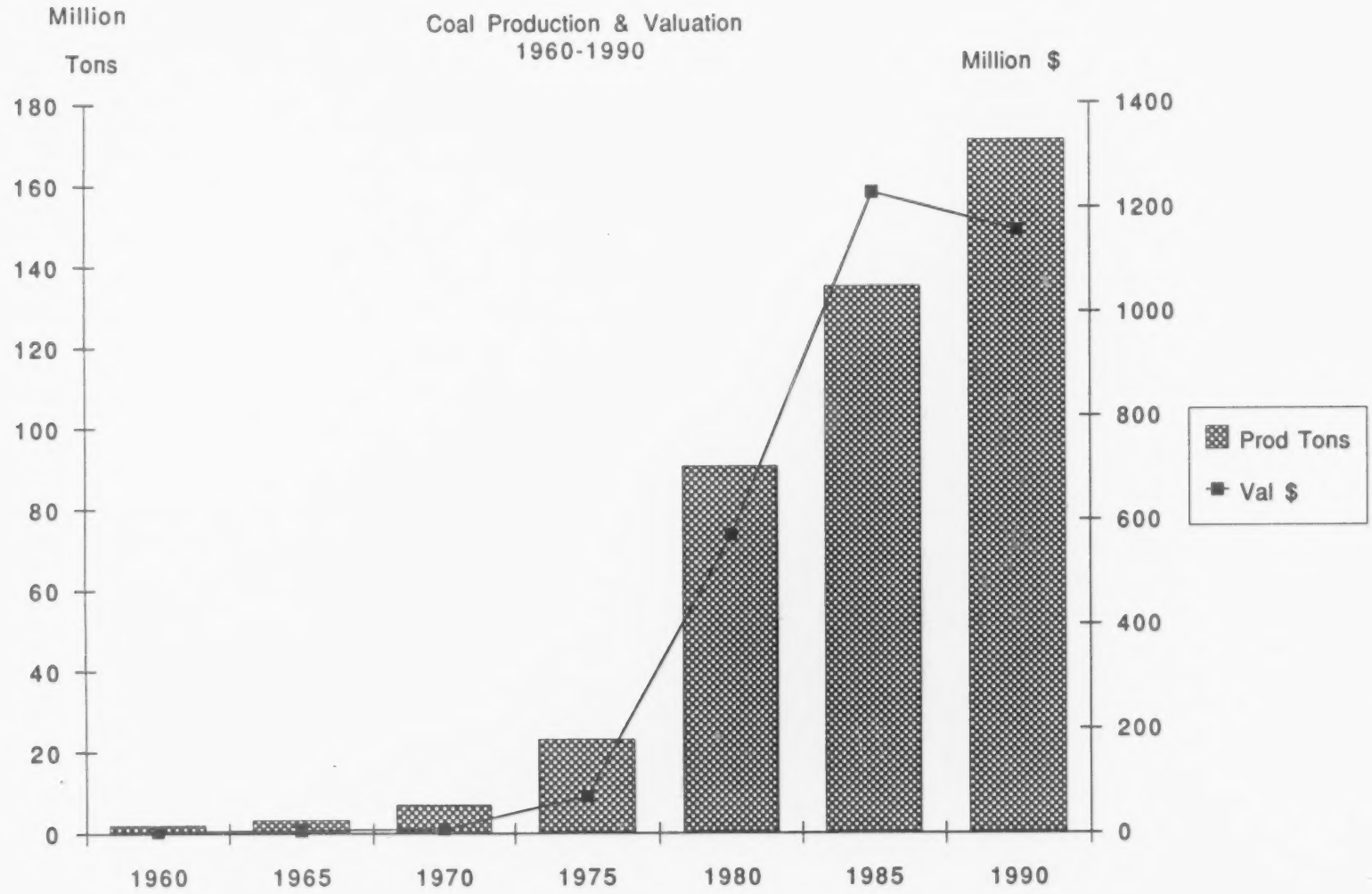
HISTORICAL COAL PRODUCTION

Year	Tons	Year	Tons
1865	800	1897	2,744,960
1866	2,500	1898	2,863,812
1867	5,000	1899	3,837,392
1868	6,925	1900	4,014,602
1869	58,186	1901	4,485,374
1870	105,295	1902	4,429,491
1871	147,328	1903	4,635,293
1872	221,745	1904	5,178,556
1873	259,700	1905	5,602,021
1874	219,061	1906	6,133,994
1875	300,808	1907	6,252,990
1876	334,550	1908	5,489,902
1877	342,853	1909	6,393,109
1878	233,200	1910	7,533,088
1879	400,991	1911	6,744,864
1880	527,811	1912	7,368,124
1881	628,181	1913	7,393,066
1882	707,764	1914	6,475,293
1883	779,689	1915	6,554,028
1884	902,620	1916	7,910,647
1885	807,328	1917	8,575,619
1886	835,999	1918	9,438,688
1887	1,170,318	1919	7,219,738
1888	1,512,936	1920	9,630,271
1889	1,388,947	1921	9,666,298
1890	1,870,366	1922	7,152,324
1891	2,327,841	1923	5,990,984
1892	2,503,839	1924	7,557,923
1893	2,439,311	1925	6,758,379
1894	2,417,463	1926	6,563,179
1895	2,246,911	1927	6,513,534
1896	2,229,624	1928	6,548,902

Historical Coal Production - cont'd.

Year	Tons	Year	Tons
1929	6,666,162	1957	2,918,508
1930	6,049,282	1958	1,627,063
1931	4,992,138	1959	1,977,404
1932	4,146,814	1960	2,006,788
1933	3,979,387	1961	2,487,803
1934	4,355,791	1962	2,575,531
1935	5,184,215	1963	3,099,521
1936	5,868,972	1964	3,117,921
1937	5,903,825	1965	3,260,815
1938	5,179,074	1966	3,670,704
1939	5,387,621	1967	3,587,742
1940	5,824,926	1968	3,683,281
1941	6,664,748	1969	4,398,572
1942	8,144,972	1970	7,039,980
1943	9,202,155	1971	7,743,347
1944	9,561,545	1972	10,043,161
1945	9,879,857	1973	14,272,350
1946	7,623,968	1974	19,957,726
1947	8,038,648	1975	23,141,105
1948	6,413,602	1976	30,298,432
1949	5,981,958	1977	44,577,218
1950	6,257,416	1978	56,456,133
1951	6,310,824	1979	68,792,573
1952	6,088,338	1980	90,527,538
1953	5,247,442	1981	98,410,522
1954	2,832,636	1982	104,014,096
1955	2,921,607	1983	107,902,764
1956	2,555,456	1984	125,931,455
		1985	135,105,204
		1986	128,145,751
		1987	132,753,011
		1988	163,801,374
		1989	171,038,369
		Cumulative Total	1,977,227,476

Sources: Bureau of Mines (gross tons 1865 - 1921)
Wyoming Department of Revenue & Taxation (net tons 1921 - 1989)


Coal Production & Valuation
1960-1990
Million
Tons
Million $
180
160
140
120
100
80
60
40
20
0
1400
1200
1000
800
600
400
200
0
1960
1965
1970
1975
1980
1985
1990
Prod Tons
Val $

NATURAL GAS

Pure natural gas is composed of the simplest hydrocarbon, methane, CH_4. Natural gas, as it comes from the well, contains a number of different substances, including: ethane, propane, butane, and pentane (hydrocarbons), also carbon dioxide, helium, hydrogen, sulfide, and nitrogen.

Natural gas processing plants remove impurties in the gas and/or compress it to increase density in order to reach the heating standards of commercial gas. The materials removed from the gas by these plants are often valuable in themselves. Propane and butane are used as fuels, while ethane, pentane, and sulphur are utilized by the chemical industry. Hydrogen and helium are important industrial gases, while nitrogen, though often simply vented to the atmosphere, is being reinjected in secondary oil recovery in the Overthrust Belt. Carbon dioxide is also utilized in secondary oil recovery, as well as serving as an important refrigerant when in the liquid or solid form.

Natural gas occurs in three ways:

1. Free natural gas unassociated with crude oil.

2. Associated gas overlying and accompanying crude oil in the same reservoir.

3. Dissolved gas, which is gas in solution with the oil under reservoir conditions.

Pipeline quality natural gas has a heating value of about 1,000 calories per cubic foot. It burns with a bright flame, and the products of its combustion are carbon dioxide and water vapor. The high BTU output, plus the benign combustion products, make natural gas an excellent domestic fuel.

Wyoming has produced some natural gas since 1903, with early production coming from the Wind River and Big Horn Basins. Before 1918, Wyoming's natural gas production was included with Utah and Colorado, not allowing an individual state breakdown.

The Overthrust Belt leads Wyoming's geologic provinces in natural gas production followed by the Green River Basin, The Wind River Basin, and The Powder River Basin. As the Riley Ridge project has come on line overthrust production has continued to increase.

Wyoming currently ranks seventh in natural gas reserves in the United States. The three leading states, Texas, Louisiana, and Alaska, alone account for about three-fourths of the total reserves.

Wyoming is sixth in natural gas production behind Texas, Louisiana, Oklahoma, New Mexico, and Kansas, in that order.

Industrial, commercial, and domestic heating and a fuel for industrial processes have always been virtually the only markets for Wyoming natural gas.

The precipitous drop in oil prices have contributed to some decline in natural gas drilling. In 1989, gas production rose by 150 million MCF. A 29 cent per MCF price drop resulted in a lesser valuation on this product than might be expected.

Since this country is self-sufficient in natural gas, the oil price drop has not had a similar effect on gas prices, although they have come down from earlier levels.

The accompanying table shows historical Wyoming natural gas production.

HISTORICAL NATURAL GAS PRODUCTION

Year	Gross MCF	Net Taxable MCF
1918*	4,338,840	
1919	6,014,000	
1920	10,312,000	
1921	15,608,000	5,729,963
1922	23,427,000	10,628,238
1923	35,523,000	25,370,247
1924	46,036,000	37,674,875
1925	45,539,000	35,432,436
1926	46,567,000	35,933,311
1927	43,581,000	36,205,467
1928	47,490,000	41,474,389
1929	44,648,000	38,253,618
1930	43,219,000	36,116,642
1931	39,770,000	34,943,043
1932	28,938,000	32,825,682
1933	25,830,000	27,716,094
1934	23,148,000	27,437,123
1935	26,643,000	29,856,668
1936	29,322,000	33,241,655
1937	31,023,000	33,418,463
1938	38,400,000	32,655,704
1939	44,700,000	28,828,909
1940	40,000,000	34,606,554
1941	43,409,000	37,242,868
1942	46,471,000	39,657,890
1943	52,000,000	40,233,211
1944	51,000,000	42,761,950
1945	52,000,000	44,571,599
1946	49,700,000	41,479,104
1947	57,740,000	47,748,881
1948	79,280,000	51,103,206
1949	87,450,000	53,948,462
1950	92,050,000	66,266,055
1951	95,600,000	73,136,179

Historical Natural Gas Production - cont'd.

Year	Gross MCF	Net Taxable MCF
1952	104,300,000	77,253,383
1953	104,900,000	77,982,000
1954	100,400,000	76,144,783
1955	100,000,000	81,457,597
1956	102,000,000	91,072,880
1957	159,000,000	113,937,978
1958	158,000,000	120,449,451
1959	194,000,000	151,611,826
1960	213,800,000	169,747,464
1961	226,800,000	185,585,937
1962	230,800,000	195,104,386
1963	240,500,000	193,637,934
1964	259,900,000	221,588,565
1965	258,900,000	218,565,497
1966	266,966,000	216,263,811
1967	257,965,000	209,582,267
1968	283,916,000	220,631,045
1969	342,998,000	243,825,419
1970	317,970,129	260,037,715
1971	310,113,187	282,320,781
1972	308,668,300	285,426,141
1973	321,134,758	287,818,223
1974	291,521,549	265,600,635
1975	273,076,164	248,528,881
1976	330,220,509	260,752,431
1977	298,535,962	272,300,637
1978	372,526,289	273,724,975
1979	390,493,988	333,322,180
1980	450,533,045**	349,634,385

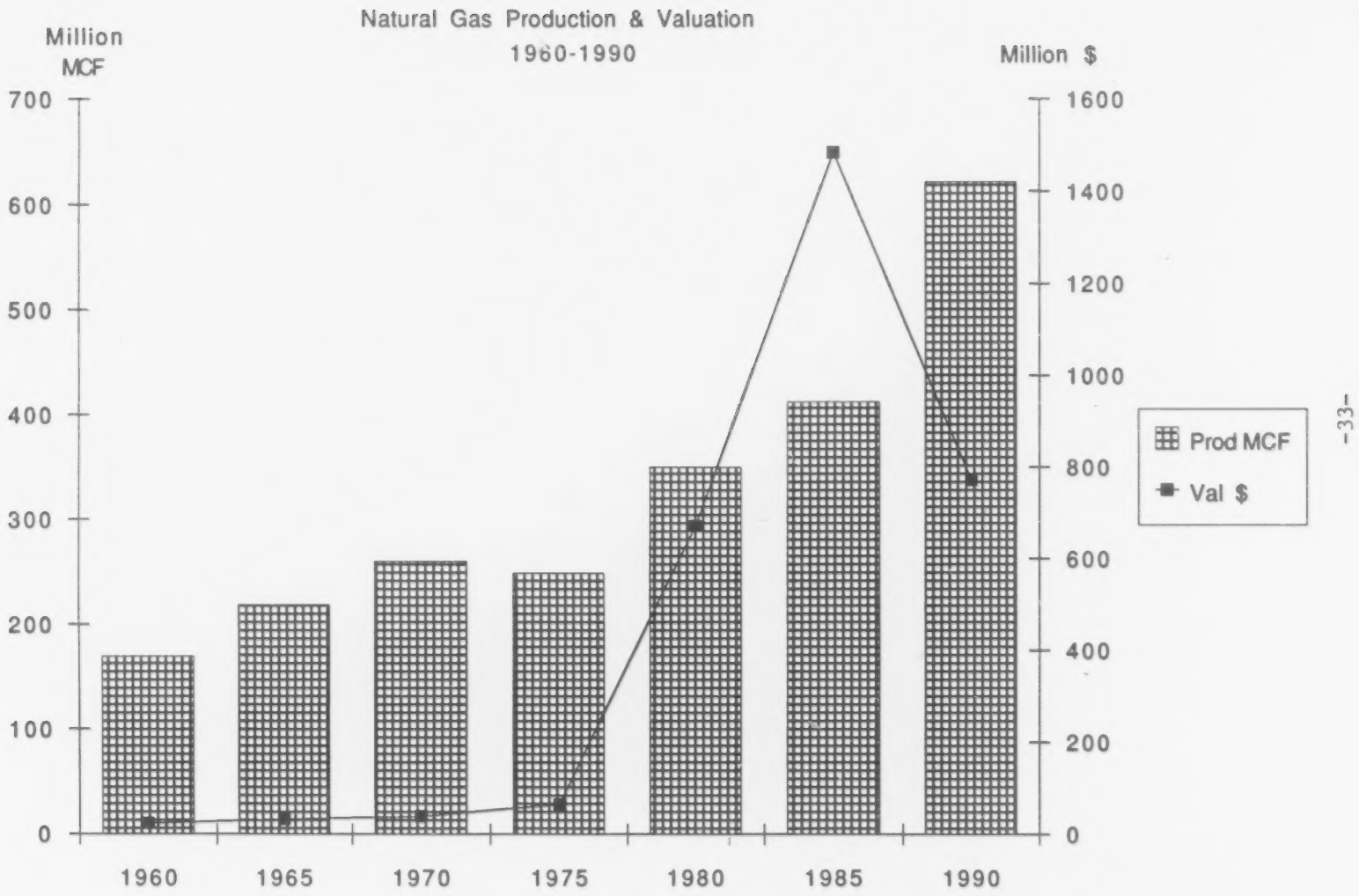
Historical Natural Gas Production - cont'd.

Year	Gross MCF	Net Taxable MCF
1981	437,014,500**	353,076,052
1982	459,321,013**	351,192,737
1983	539,774,090**	395,656,547
1984	600,137,792**	447,515,295
1985	597,896,090**	412,026,614
1986	596,978,338**	352,799,892
1987	733,210,238**	407,862,822
1988	811,891,107**	471,363,924
1989	665,698,542	621,502,138
Cumulative Totals	14,020,196,593	10,928,641,229

Sources: Bureau of Mines (1918 - 1969)
Wyoming Department of Revenue and Taxation (1970-1989)

**Wyoming Oil and Gas Commission

*Wyoming has had gas production since 1903, but it was included in other states.


Natural Gas Production & Valuation
1960-1990
Million MCF
Million $
700
600
500
400
300
200
100
0
1600
1400
1200
1000
800
600
400
200
0
1960
1965
1970
1975
1980
1985
1990
Prod MCF
Val $

PETROLEUM

The first recorded reference to the occurrence of oil in Wyoming dates back to 1833, when Captain Bonneville visited the "Great Tar Spring" on the Popo Agie River near present day Lander.

The first commercial marketing of oil occurred in 1851 from an oil seep on Poison Spider Creek, west of present day Casper. Records indicate that Jim Bridger, Kit Carson, and others mixed the oil with flour and sold the product to settlers as axle grease.

The first oil field was discovered by Mike Murphy in 1884, when he drilled a 300 foot well near the "Great Tar Spring". This field, Dallas Dome, is still producing oil, 100 years after its discovery.

Pennsylvania Oil and Gas Company built the first small refinery in Wyoming at Casper in 1895. During the period 1900-1920, drilling revealed several of the state's largest fields, including Oregon Basin and Elk Basin in Park County, Garland in Big Horn County, and Lost Soldier in Sweetwater County.

The lack of nearby markets and the high cost of transporting oil by rail, resulted in low demand for Wyoming oil, and crude prices dropped to as low as 10 cents per barrel in the 1930's. It was not until World War II that development moved into full swing. This expansion continued into the 1970's.

Oil is derived from the alteration of organic matter by heat and pressure. Petroleum originates in sedimentary rock environments, but may migrate to other locations, so that there are oil reservoirs known from volcanic and metamorphic rock sequences as well. Most oil is found in sedimentary rocks, in occurrences which may be divided into structural or stratigraphic traps. A structural trap is one where the oil is maintained in place by mechanical means, such as, folding, faulting, or some combination of the two. Stratigraphic traps involve a change in rock type, from permeable to impermeable, with the oil held in the permeable portion. A stratigraphic unit which changes from a sandstone (permeable) to a shale (impermeable) is an example of a stratigraphic trap. Most of the early discoveries in Wyoming were in large structural traps with obvious surface expression. Modern exploration is focused on deep, subtle structures using sophisticated seismic

techniques to discover new reserves. The delineation of stratigraphic traps is based on careful analysis of trends and rock types along with the application of interpretation and imagination by petroleum geologists.

Reservoir rocks in Wyoming range from Tertiary to Precambrian in age. In general, fields in stable interior basin areas are characterized by stratigraphic traps and produce from younger (Cretaceous and Tertiary) formations. Fields in more highly deformed basin margins are usually characterized by structural traps, and production is from older rocks.

The largest oil producing regions in Wyoming, in order, are: the Powder River Basin, Green River Basin, Big Horn Basin, Overthrust Belt, and Wind River Basin.

Early oil production in Wyoming peaked in 1923, after discovery and development of large fields, such as: Salt Creek, Elk Basin, Oregon Basin, and Hamilton Dome. A long period of decline followed these early discoveries until the second World War led to a resurgence which continued to 1970, when the maximum annual production of 155,743,349 barrels was recorded. Since 1970 production has been steadily declining, due to depletion of the old large fields, like Salt Creek. At present, over 50 percent of Wyoming's production comes from ten large fields which average over 50 years in age. Newer discoveries in the state are concentrated primarily in Campbell County (Hilight, Raven Creek, Hartzog Draw fields) and the Overthrust Belt.

Wyoming ranks fourth in crude oil production, behind Texas, , Louisiana and California. . However, it dominates Rocky Mountain production, with 42% of the production from the area, along with 65% of the reserves.

The dominant use of petroleum is as a fuel for internal combustion engines or industrial and residential heating. However, petroleum derivatives are used to manufacture many kinds of lubricating and hydraulic fluids, fibers, medicines, plastics, and a number of other products, ranging from paints to synthetic rubber.

Although production has been slowly declining, valuation of oil production in Wyoming increased dramatically since the initiation of OPEC price increases in the early 1970's, and since decontrol of domestic oil prices in 1980. In 1989, oil production accounted for 44% of the state mineral valuation, some 1.6 billion dollars.

Oil valuation has declined since 1981 but this decline has been reversed in the last 5 months, and petroleum will remain the state's most valuable mineral product.

Currently, six refineries are operating in Wyoming with a total capacity of 175,000 barrels per day. These refineries can process less than half of Wyoming's daily crude oil production, the remainder being transported by pipeline to neighboring states.

The most recent estimate of discovered oil reserves in Wyoming, made by the American Petroleum Institute, reports a total state reserve of 800 million barrels. This figure has been declining steadily since 1971, and although new discoveries in the Overthrust Belt will slow the decline, the downward trend will continue.

The jump in production seen in 1984 is due to liquids stripped in the Overthrust gas processing plants being included in oil production.

Given new exploration techniques, along with enhanced recovery methods which are coming into increasing use, Wyoming will continue to lead the Rocky Mountain region in oil production for some time. If oil shale utilization ever reaches large scale fruition, Wyoming will be a significant oil producer well into the next century.

Oil prices rose by a little over $3.00 a barrel in 1989, and the duration and amount of the upswing will depend on World events. Production totals in 1989 were down , although future trends are hard to predict.

Rebound will stabilize, but the question is, what remnant of the oil industry will survive, and in what condition will U.S. energy security be when conditions finally improve?

HISTORICAL PETROLEUM PRODUCTION

Year	Gross Bbls.	Net Taxable Bbls.
1894	2,369	
1895	3,455	
1896	2,878	
1897	3,650	
1898	5,475	
1899	5,560	
1900	5,450	
1901	5,400	
1902	6,253	
1903	8,960	
1904	11,542	
1905	8,454	
1906	7,000	
1907	9,339	
1908	17,775	
1909	22,137	
1910	115,430	
1911	186,695	
1912	1,572,306	
1913	2,406,522	
1914	3,560,375	
1915	4,245,525	
1916	6,234,137	
1917	8,978,680	
1918	12,596,287	
1919	13,172,000	
1920	16,831,000	
1921	19,333,000	16,066,125
1922	26,715,000	16,926,406
1923	44,785,000	21,769,826
1924	39,498,000	35,714,747

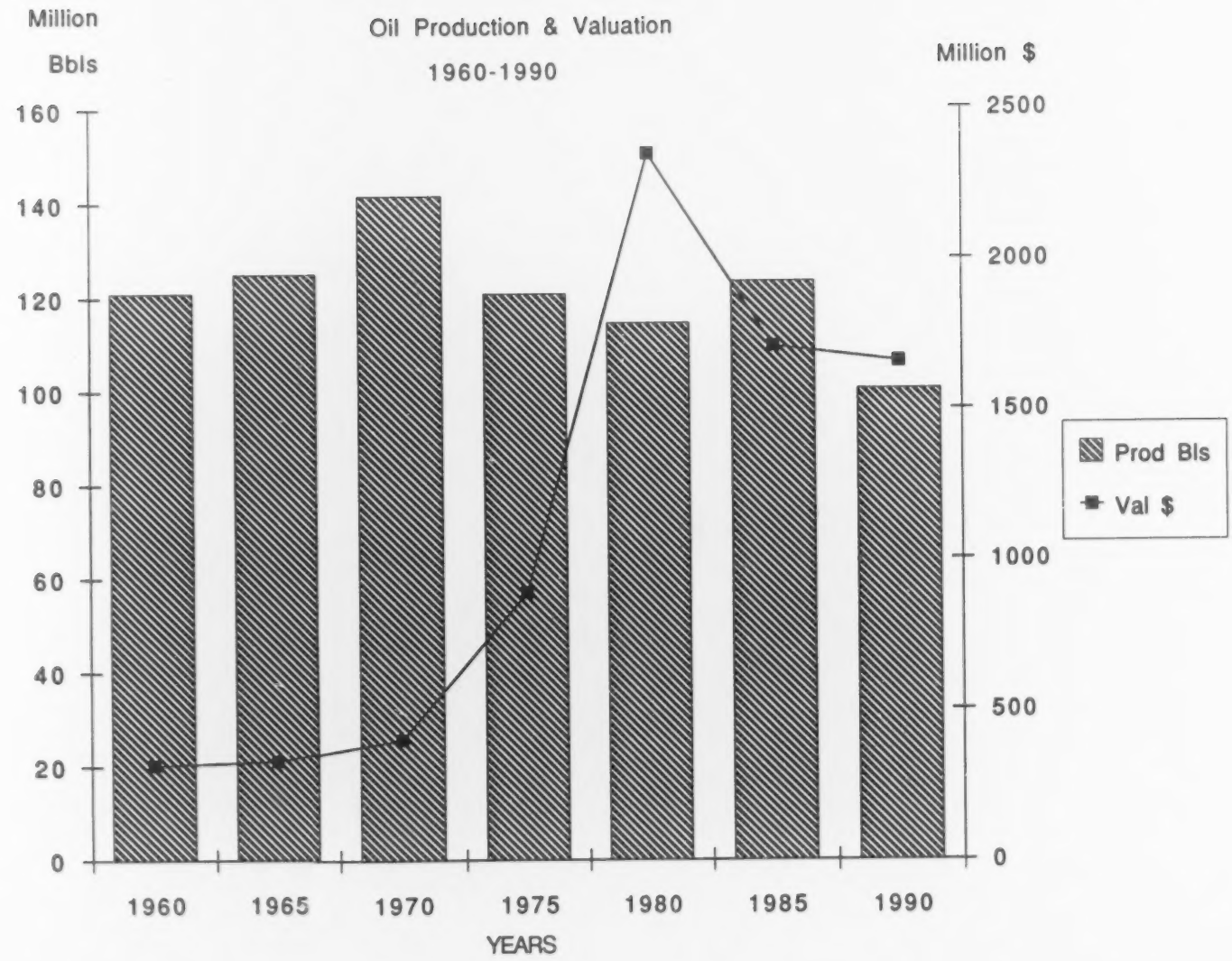
Historical Petroleum Production - cont'd.

Year	Gross Bbls.	Net Taxable Bbls.
1925	29,173,000	32,495,306
1926	25,776,000	24,753,727
1927	21,307,000	21,681,708
1928	21,461,000	18,508,699
1929	19,314,000	16,895,390
1930	17,868,000	15,639,170
1931	14,834,000	13,008,011
1932	13,418,000	11,353,006
1933	11,227,000	10,124,504
1934	12,556,000	11,108,115
1935	13,755,000	12,247,316
1936	14,582,000	13,062,296
1937	19,166,000	17,704,873
1938	19,022,000	17,781,813
1939	21,454,000	20,465,457
1940	25,711,000	24,242,112
1941	29,878,000	28,378,725
1942	32,812,000	30,259,013
1943	34,253,000	31,454,751
1944	33,356,000	30,554,213
1945	36,219,000	33,253,522
1946	38,977,000	35,847,249
1947	44,722,000	40,662,626
1948	55,032,000	49,978,630
1949	47,890,000	44,150,095
1950	61,631,000	56,411,712
1951	68,929,000	63,444,374
1952	68,074,000	62,723,252
1953	82,618,000	76,839,278
1954	93,533,000	85,005,784
1955	99,483,000	91,006,385
1956	104,830,000	96,278,109

Historical Petroleum Production - cont'd.

Year	Gross Bbls.	Net Taxable Bbls.
1957	106,616,000	100,373,021
1958	109,584,000	103,483,116
1959	125,968,000	113,643,205
1960	133,910,000	121,097,650
1961	141,937,000	128,657,407
1962	135,847,000	123,381,779
1963	144,407,000	123,852,669
1964	138,752,000	125,376,557
1965	138,314,000	125,136,181
1966	134,470,000	121,638,887
1967	136,310,000	122,816,724
1968	144,250,000	129,985,723
1969	154,945,000	140,522,875
1970	155,743,349	141,546,503
1971	146,261,295	132,588,059
1972	137,564,566	125,222,375
1973	139,054,568	126,943,274
1974	138,735,974	127,555,252
1975	132,237,026	120,629,951
1976	134,148,510	120,571,157
1977	135,994,695	124,328,857
1978	137,384,886	122,799,348
1979	126,669,861	115,678,022
1980	126,361,962*	114,284,582
1981	118,844,000*	111,912,600
1982	117,898,667*	108,055,462
1983	120,979,721*	110,420,981
1984	127,763,146*	117,289,568
1985	130,984,917*	123,172,534
1986	122,409,887*	111,148,577
1987	115,922,003*	112,981,314
1988	114,322,298*	111,207,959
1989	107,740,581	100,354,382
Cumulative Total	5,765,598,666	5,186,147,976

Sources: Bureau of Mines (1894-1969)
Wyoming Department of Revenue and Taxation (1970-1989)
*Wyoming Oil and Gas Commission


Million
Bbls
Oil Production & Valuation
1960-1990
Million $
160
140
120
100
80
60
40
20
0
2500
2000
1500
1000
500
0
1960
1965
1970
1975
1980
1985
1990
YEARS
Prod Bls
Val $

TRONA

The world's largest deposit of trona is found in Wyoming's Green River Basin. From the deposit, the state produces about 95 percent of the nation's supply of natural soda ash. Several deposits of natural soda ash are known in the western United States, but only Wyoming and California have active mines. Deposits have also been identified in several other countries, but the only one currently producing is Kenya.

Trona is a water-bearing sodium bicarbonate compound with many uses. Trona originated as a precipitate from a large fresh-water lake, Lake Gosiute, which covered as much as 15,000 square miles of surface in southwestern Wyoming. The trona was precipitated when Lake Gosiute underwent a period of restricted circulation and became highly saline at the same time as elevated temperatures resulted in increased evaporation.

More than 40 individual beds of trona underlie an area of about 1,300 square miles. It is estimated that some 50 billion tons of mineable trona, plus an additional 30 to 40 billion tons of marginal trona, are contained in these beds.

In 1938, Mountain Fuel Supply Company drilled an oil and gas test well northwest of Green River, Wyoming, and discovered a brine rich in trona. Exploration by the Union Pacific Railroad, in 1940-1942, indicated the presence of extensive reserves of trona. In 1946, Westvaco, the predecessor of FMC Corporation, sank a 1500 foot shaft to the main trona deposit and constructed a pilot refinery at the surface. The first soda ash was produced by FMC in 1950, with Stauffer Chemical coming on line in 1962, Allied Chemical in 1968, Texasgulf in 1975, and Tenneco Oil Company in 1982.

All Wyoming trona mining is done underground. Room and pillar methods and coal mining equipment, modified to withstand the harder ore, are used.

Both conventional and continuous mining techniques have been traditionally used, but recently long wall mining has been successfully employed.

In the past, soda ash was primarily produced synthetically by the Solvay process. This process combines salt (sodium chloride) and calcium carbonate (limestone) to make sodium carbonate (soda ash).

The last plant using the Solvay method in this country was shut down in 1987. The Solvay plant shutdowns were partly the result of high capital, labor, and energy requirements, but the greatest factor was the environmental considerations. For each ton of soda ash produced by the Solvay process, about 1.7 tons of waste are generated, which poses an enormous disposal problem.

Trona is refined by first subjecting the ore to a heat of 400`F to remove water of crystallization, combustible materials, and carbon dioxide. This crude soda residue is then taken into water solution and filtered to remove insoluable residues. The filtered material is then dried. The final product is pure soda ash.

Trona's primary use is in glassmaking, which takes around 55% of the United States' consumption. The chemical industry accounts for 23% of consumption, followed by soap and detergent at 5%, pulp and paper manufacturing at 4%, water treatment at 3%, and 10% in various applications including pharmaceuticals, photography, metallurgy, and petroleum refining.

Wyoming trona production has grown from 29,658 tons in 1950, to 16,212,715 tons in 1989. Valuation on 1989 production was $150,600,216. The short-term future of Wyoming trona appears good, based primarily on the industries aggressive marketing and discovery of new applications such as stack gas scrubbing.In the longer term, significant growth in Wyoming's trona market would seem to be likely to come from Europe, where most soda ash is currently produced by the Solvay process, with the same problems there as in this country.

China has expressed interest as well, but she has abundant raw materials for Solvay extraction, and is currently building a large plant to utilize them using this process.

Whatever the demand, Wyoming possesses the resources to meet it. If trona had been mined at the current rates since the year 1 A.D., only 20% of the known reserves would have been depleted, and if mining had proceeded at the same rate since the rise of the first dynasty in Egypt, 50% of the known reserves would still remain untouched.

An annual compilation of trona production in Wyoming is given in the following table.

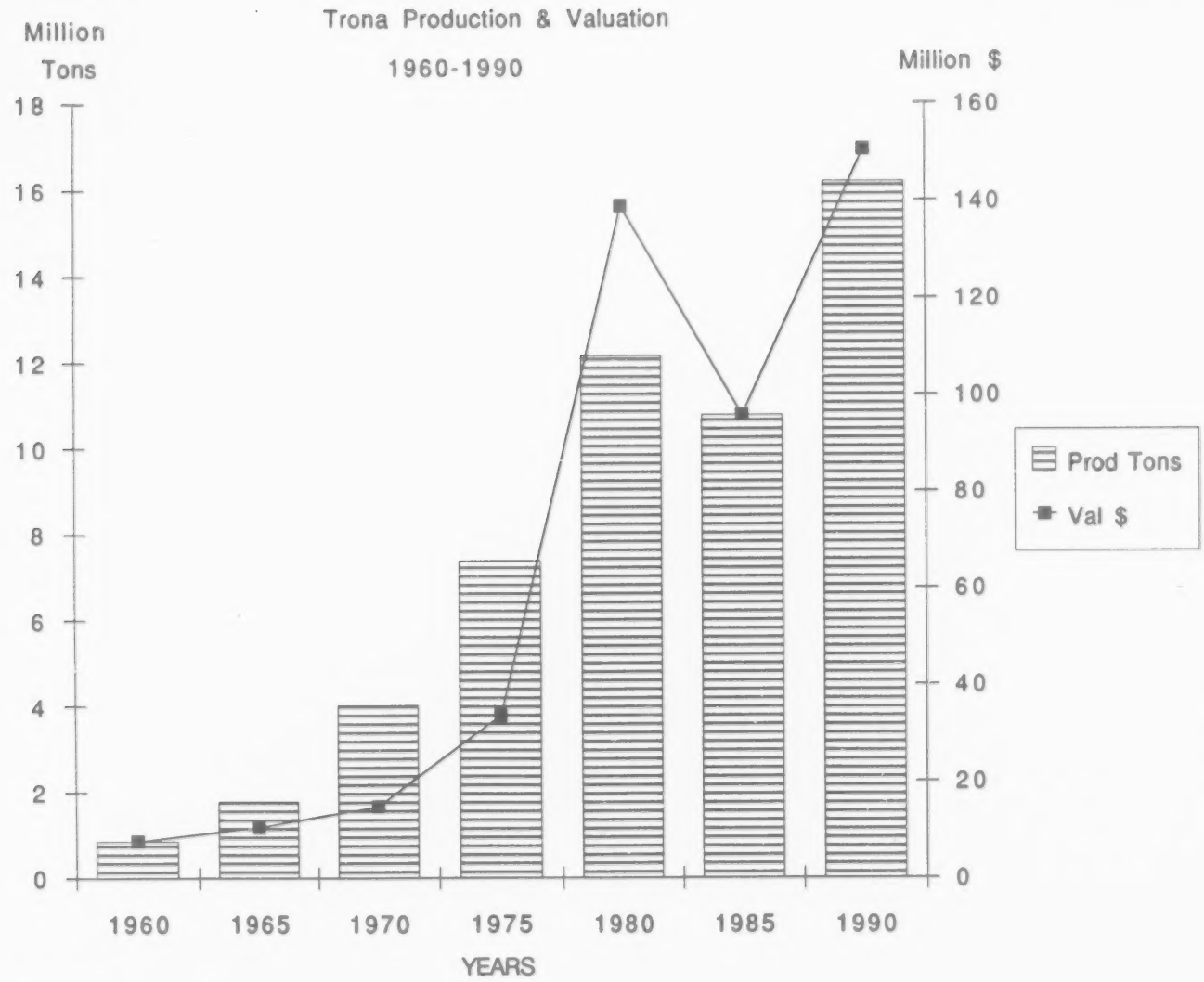
HISTORICAL TRONA PRODUCTION

Year	Net Tons
1950	29,658
1951	76,769
1952	56,733
1953	262,001
1954	465,851
1955	529,311
1956	541,456
1957	633,917
1958	564,474
1959	747,164
1960	862,879
1961	809,762
1962	1,082,119
1963	1,200,525
1964	1,480,746
1965	1,782,745
1966	2,147,390
1967	2,323,475
1968	2,793,325
1969	3,708,657
1970	4,022,304
1971	4,203,677
1972	4,783,946
1973	6,029,984
1974	7,070,617
1975	7,379,792
1976	8,800,607
1977	10,215,602

Historical Trona Production - cont'd.

Year	Net Tons
1978	9,974,237
1979	11,771,985
1980	12,159,241
1981	11,787,731
1982	10,073,690
1983	10,542,417
1984	10,971,209
1985	10,776,304
1986	11,919,530
1987	12,422,255
1988	15,114,169
1989	16,212,715
Cumulative Total	218,330,706

Source: Wyoming Department of Revenue and Taxation


Trona Production & Valuation
1960-1990
Million
Tons
Million $
18
16
14
12
10
8
6
4
2
0
160
140
120
100
80
60
40
20
0
1960
1965
1970
1975
1980
1985
1990
YEARS
Prod Tons
Val $

URANIUM

Uranium was discovered as an element in 1789 and isolated as a metal in 1842. A few minor uses for uranium salts and medical demand for radium created a small market in the 1920's and 1930's. So little was known about possible ore sources in the United States that the uranium ore used in the production of the two atomic bombs dropped on Japan came from the Belgian Congo. The Atomic Energy Commission was appointed by President Truman in 1946. In the late 1940's and early 1950's the public was encouraged to prospect for uranium and the first great uranium rush was on.

Uranium is a widespread, though uncommon, primary constituent of crystalline rocks of the earth's crust. As a result of weathering processes, it is often removed from these source rocks and redeposited in sediments. Uranium deposits are known from rocks as old as Precambrian, and as recent as Pleistocene, and all ages in-between.

The most important deposits of uranium in Wyoming occur in permeable sandstones of Tertiary age. The uranium was originally contained in the crystalline rocks which form the cores of the state's mountain ranges. The uranium was leached from these rocks and precipitated in the much younger sandstones.

Uranium ore is recovered by open pit, underground, and solution mining methods. Open pit and underground mining is carried out in the usual manner, the only difference being that the material to be removed is determined by using a scintillation counter to delineate the radioactive ore.

In solution mining, a shaft is drilled into the ore body. Chemicals are introduced down this shaft which dissolve the uranium out of the rock. The uranium-containing solution is removed through another well or wells drilled to the depth of the ore body. The solution on the surface is processed much as the solutions obtained by conventional milling methods to remove the dissolved uranium. Due to the toxic nature of the solutions used, great care must be exercised in solution mining operations to prevent ground water contamination.

Milling involves grinding and crushing the ore, after which it is treated with acid to take the uranium into solution. The leachate is

treated with various chemicals to concentrate the uranium and simplify it chemically. The final concentrate is evaporated to yield "yellow cake". The yellow cake consists almost entirely of uranium 238 and a small percentage of uranium 235, the fissionable isotope. The uranium must be enriched to around 3.5% U 235 for power reactor use, while weapons grade material has a U 235 content of over 90%. The yellow cake is shipped to various conversion and enrichment facilities to be upgraded to the required level.

The primary uses of uranium are as fuel for nuclear reactors and national defense. The drop in power demand coupled with uneasiness over plant reliability have combined to slow the construction of nuclear power plants, and greatly reduce the requirements for uranium. Defense requirements are difficult to determine, but new weapon construction plus upgrading of existing stock piles (nuclear warheads deteriorate through time) has increased, though not enough to increase demand significantly. Other uses for uranium are in X-ray tubes, ultraviolet lamps, glass colorants, ceramics, and steel.

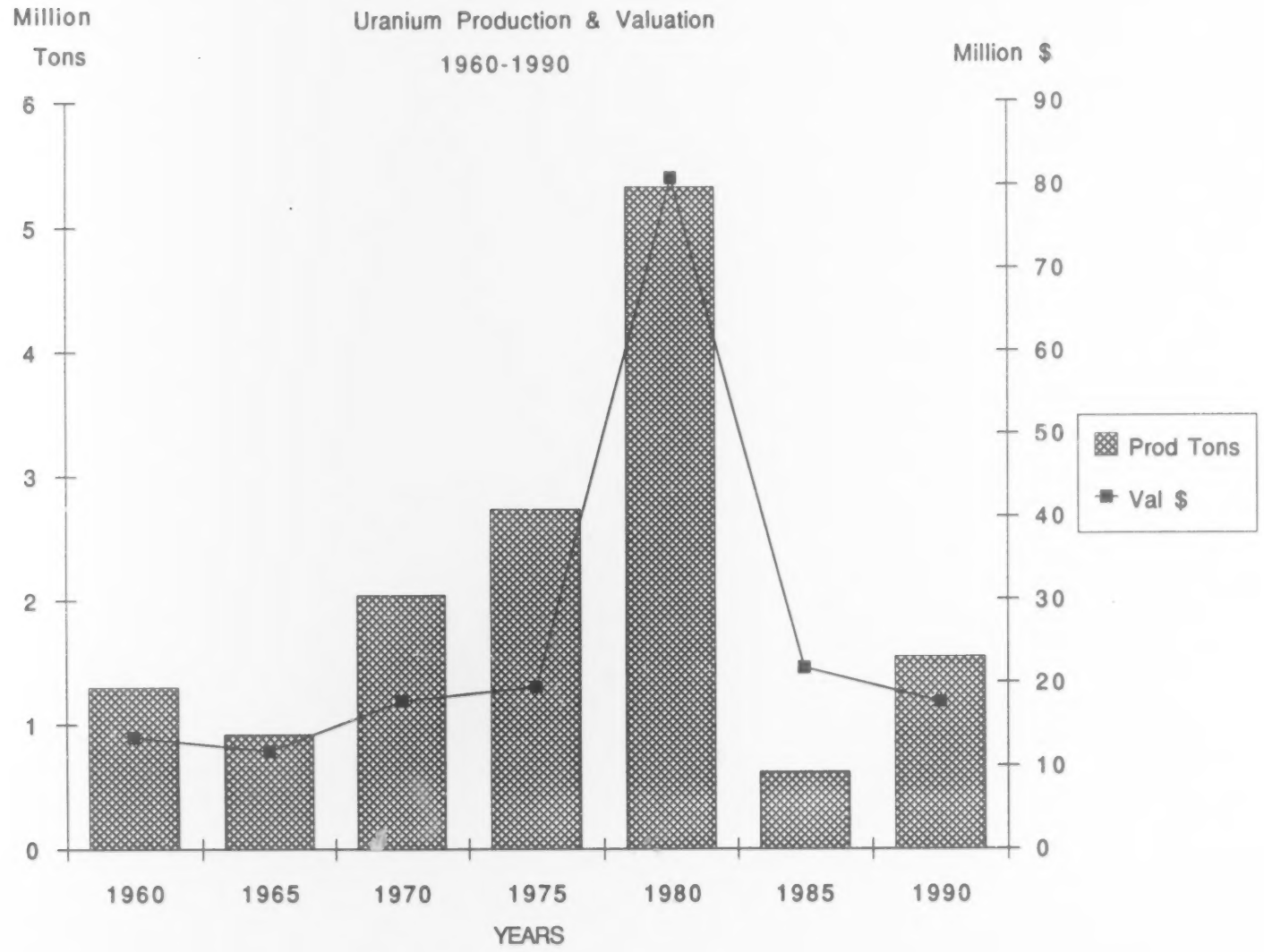
Wyoming's first production of uranium occurred in 1953, when 5,156 tons of ore were mined. The largest production of 5,517,070 tons was attained in 1978. Wyoming ranks second to New Mexico in amount of reserves.and was fifth in production in 1989 The history of Wyoming uranium production is given in the accompanying table.

As of January 1989, Wyoming had one active uranium surface mining operation (temorarily closed) and one in-situ project. All of the production from these operations was ticketed for foreign customers. Given the availability of cheap high grade ore from abroad coupled with the difficulties of the domestic nuclear power industry, it seems unlikely that the uranium mining and milling industry will ever again play a significant role in Wyoming's mineral economy. The reserves are here, but market and competition factors make the future appear bleak.

HISTORICAL URANIUM PRODUCTION

Year	Net Tons
1953	5,156
1954	10,443
1955	45,782
1956	116,463
1957	264,133
1958	559,053
1959	810,514
1960	1,307,919
1961	1,542,192
1962	1,394,704
1963	1,289,595
1964	1,126,827
1965	1,222,821
1966	916,415
1967	1,242,187
1968	1,977,258
1969	1,631,518
1970	2,042,074
1971	2,044,943
1972	2,390,100
1973	2,588,011
1974	2,287,697
1975	2,736,663
1976	3,302,422
1977	3,986,025
1978	5,517,070
1979	5,512,345
1980	5,352,337
1981	4,560,683
1982	3,895,510
1983	3,022,650
1984	1,634,262
1985	619,967
1986	226,821
1987	244,087
1988	1,442,123
1989	1,540,412
Cumulative Total	70,234,810

Source: Wyoming Department of Revenue and Taxation


Uranium Production & Valuation
1960-1990
Million
Tons
Million $
6
5
4
3
2
1
0
90
80
70
60
50
40
30
20
10
0
1960
1965
1970
1975
1980
1985
1990
YEARS
Prod Tons
Val $

MISCELLANEOUS MINERALS

COPPER

Copper was the first metal utilized by man over 6,000 years ago. Native uncombined copper was utilized for tools, weapons, and jewelry due to the ease with which it could be shaped.

Currently, over half of the copper produced is used in the electrical industry for wire, equipment, and components. Next to silver, copper has the highest electrical conductivity of any metal. Other uses of copper are in plumbing, instruments, household utensils, decorative items, and coinage.

Copper occurs as the native metal or combined in sulphides oxides, and carbonates. These secondary compounds are the result of weathering and concentration of copper from its original source in low silica igneous rocks.

Copper mineralization occurs sporadically throughout every mountain range in Wyoming. Copper mineralization is most common in Precambrian rocks, but is found in younger rocks in places such as the northern Laramie mountains and the Hartville uplift.

In the interval between 1899 and 1908, over 23.5 million pounds of copper were produced in Wyoming, mostly from the Encampment district, west of Laramie, and in this period Wyoming was one of the leading copper producing states in the nation. Copper production increased during World War I, mostly from the Hartville area, north of Wheatland. Since that time, Wyoming copper production has been insignificant.

CONSTRUCTION MATERIALS

The construction materials mined in Wyoming are crushed rock for cement, sand and gravel, railroad ballast, scoria,and limestone. The cement industry is the largest non-fuel minerals industry in the nation. Cement is vital to the construction and road-building industries and is literally the backbone of modern civilization. Wyoming does have one cement plant in Albany County.

Sand and gravel is the only mineral commodity which is produced in all 50 states, and coincidentally is the only one produced in all of Wyoming's 23 counties. Its primary uses are as aggregate for concrete and bituminous mixes, for road bases and coverings and as fill. Pure sand is used in glass manufacture, foundry molding, and metallurgical applications.

Limestone is utilized as a building and decorative stone, road metal, aggregate, and in sugar beet factories where pure limestone is used as a source of lime and carbon dioxide in the refining process.

Railroad ballast consists of crushed granitic rock and is utiliuzed in the construction and maintennance of road beds.

Scoria is shale baked during the spontaneous combustion of coal beds. It is used as road aggreghate in the northeastern part of the state.

The Geological Survey of Wyoming has a construction materials map of the state.

DIAMONDS

Diamond is composed of carbon, arranged in a crystal structure which makes it the hardest natural substance known. Diamonds were first prized as gemstones centuries ago in India and Borneo. It was not until much later that the applications of diamond as an abrasive in grinding wheels and drill bits, and as wire drawing dies, were realized.

Diamonds are produced in South Africa, the U.S.S.R., Brazil, and the East Indies. No natural diamonds are produced in the United States, although the General Electric Company has produced synthetic diamonds of industrial grade since 1955.

The primary source of diamonds is the mineral Kimberlite, a greenish gray crystalline rock which is the solidified lava conduit of an ancient volcano. Diamonds are produced naturally in the high pressures and temperatures found in pockets of molten rock deep beneath the surface. Exposure of these Kimberlite pipes results in weathering of diamonds from the rock and their concentration in stream gravels. About 50% of the diamonds recovered are taken by placer mining of old stream channels.

Kimberlite pipes occur along the eastern Wyoming-Colorado border. A number of small (less than 2 mm) diamonds have been extracted from these rocks. The Wyoming Geological Survey has an on-going program to identify heavy-mineral anomalies in the state which may be indicators of Kimberlite occurrences. Thus far, some 150 such anaomalies have been identified.

GYPSUM

Gypsum has been used since ancient times for carving and decoration. The Greeks used it to manufacture plaster, which remains the principle use for the mineral. In the late 1800's a method to retard the setting of gypsum plaster was developed, and this revolutionized the industry by permitting the use of plaster in construction. The development of prefabricated wallboard revolutionized the industry again in the 1960's. Approximately two-thirds of the gypsum currently marketed is in the form of prefabricated products.

Gypsum is precipitated primarily from sea water, but may be deposited in saline lakes or hot springs. It often occurs as a product of volcanic activity and may occur in metallic mineral veins.

Gypsum in Wyoming, primarily occurs in layers in Permian, Triassic, and Jurassic red beds at various localities within the state. Some gypsum has been mined in Wyoming since the 1890's, but current production comes from mines in Albany, Big Horn, and Park Counties. All of Wyoming's gypsum output from the Bighorn Basin is utilized in the manufacture of wallboard, while the Albany County mine's production is used in the manufacturing of cement.

JADE

Jade has been a prized gemstone in China and the Far East for a long time. It is valued for its toughness, ability to take a high polish, and the ease with which it is carved.

The term jade is applied to two different minerals which have roughly similar properties. The mineral jadeite is a sodium aluminum silicate. It is hard and tough, and varies from white to greenish-white to emerald green. It has been found in Burma, Southern China, Tibet, Mexico, and South America. No jadeite has been found in Wyoming. The second variety of jade is the mineral nephrite, a calcium-magnesium-aluminum silicate. It is not quite so hard or tough as jadeite. Its color varies from olive-green through dark green to black. Light "apple-green" jade is the most valued. It has been found in China, Turkestan, Siberia, New Zealand, and Alaska, as well as Wyoming.

Jadeite occurs in metamorphic rocks in veins and masses. Nephrite occurs as veins in metamorphic rocks. Wyoming jade occurs as veins in Precambrian metamorphic rocks in the southern Wind River Mountains. Boulders and pebbles of jade occur around the southern end of the Wind River Mountains and on the north end of the Laramie Mountains to the east. Although the jade industry of Wyoming is small, it is well known throughout the world and provides some income and/or a hobby for many people.

ZEOLITES

Zeolites are sodium and/or calcium-aluminum silicate minerals that occur in bedded clay deposits or in vesicles in volcanic rocks. Their current use is in water softening due to their ability to exchange ions with solutions they contact. It is projected that they will be used on a large scale for extraction of radioactive products from nuclear reactor wastes.

The Beaver Rim area of Fremont County contains layered zeolites bedded with clays exposed over a considerable area; however, there is no commercial production at this time. Rocky Mountain Zeolites is developing a deposit located in the Washakie Basin in Sweetwater County. The firm is planning to market natural Clinoptolite (A zeolite mineral) for use in removing ammonia from aquaculture, agriculture, and waste-water treatment products.

WYOMING ENERGY CONSUMPTION
1990

Wyoming Energy Consumption

Wyoming is a net exporter of all energy forms it produces. The state exports much larger quantities of liquid fuels, natural gas, coal, and electricity than it consumes. In years past, the mineral yearbook has addressed only production. The value of energy minerals to Wyoming's economy has been established. This section is offered to reflect Wyoming's small energy consumption, relative to its contribution to the Nation's energy pool.

Department of Energy tabulations consistently rank Wyoming as the highest per capita energy consuming state in the nation. Three factors contribute to that high per capita consumption.

1. Wyoming is a large state with great distances between communities. As a consequence, travel in the state requires larger amounts of gasoline.

2. Wyoming winter temperatures can drop below zero and remain there for days at a time. Low temperatures coupled with winter winds make the Wyoming climate a rigorous one. Such a climate requires high consumption of fuels.

3. Most important, Department of Energy use statistics reflect the energy produced in a state. Wyoming produces large amounts of coal, petroleum, natural gas, and electricity which are energy intensive industries. As a consequence, Wyoming residents appear as energy gluttons, when in fact much of the consumption attributed to them is exported and utilize elsewhere.

The remainder of this section is devoted to an analysis of energy produced and consumed in Wyoming, and provides comparisons of energy production to energy consumption by county wherever data is available.

Gasoline and Diesel

Wyoming's refineries have an annual capacity of 2.6 billion gallons of crude oil per year. Estimated capacity during 1989 was 80 percent, resulting in a through-put of 2.1 billion barrels. Approximately 50% of a refinery's output is gasoline, resulting in an approximate 1989 gasoline production in Wyoming of 1 million gallons of gasoline. Wyoming consumption is about 30% of that amount.

The following figures reflect gasoline sales, and as such include amounts purchased by vehicle users passing through the state as well as residents. There is no way to break out resident versus transient consumption, but nonresident gasoline use is quite significant,. as three major interstates traverse Wyoming's borders.

Diesel consumption is not compiled on a county by county basis. Consequently, we know approximately 177,500,000 gallons of diesel fuel were purchased in Wyoming in 1989, but no regional breakdown is possible.

An analysis of users of diesel fuel in Wyoming fall into several categories:

1. Agriculture.

2. The trucking industry.
   a. A significant transient component is involved here.

3. Railroads.
   a. Again, a transient component is significant.

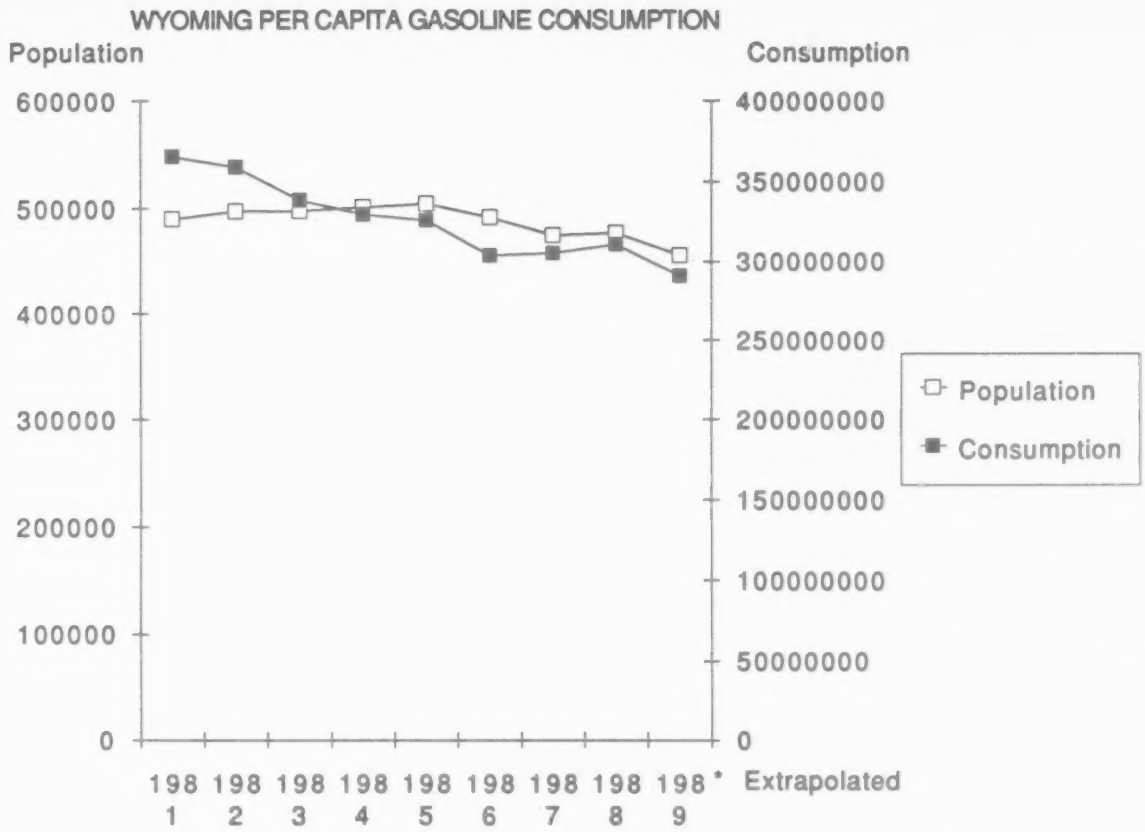
4. Public transportation.

Diesel powered private automobiles are not a significant factor.

Gasoline 1989*

County	Gallons
Albany	7,969,153
Big Horn	2,448,115
Campbell	9,247,168
Carbon	8,405,612
Converse	3,089,857
Crook	2,144,251
Fremont	8,964.541
Goshen	4,021,365
Hot Springs	1,366,893
Johnson	2,615,954
Laramie	21,213,501
Lincoln	7,899,730
Natrona	16,684,124
Niobrara	1,020,774
Park	7,070,746
Platte	2,717,998
Sheridan	7,344,756
Sublette	1,808,521
Sweetwater	13,840,225
Teton	5,334,000
Uinta	6,034,490
Washakie	2,408,850
Weston	1,765,624
TOTAL	145,380,241

* These figures are only for the first six months of 1989 due to data analysis problems. Yearly totals will reappear in later issues.



Natural Gas

Natural gas is the predominant home heating fuel in Wyoming. Its utilization in the state is widespread, as pipelines provide delivery. For estimating county consumption, the point of delivery was the determining factor. Consumption figures generally reflect population, with the exception of Washakie County which appears low and Big Horn County which appears high, neighboring counties in the Big Horn Basin.

Consumption varies with population, reflecting use in space heating. The only two counties where natural gas is not generally available, Sublette and Teton counties, utilize propane as a primary heating fuel.

For comparative purposes, natural gas contains 1,000,000 BTU's per MCF per gallon.

Wyoming produced 621,502,138 taxable MCF of natural gas in 1989. Wyoming consumed about 25 million MCF, 4% of its production.

Coal

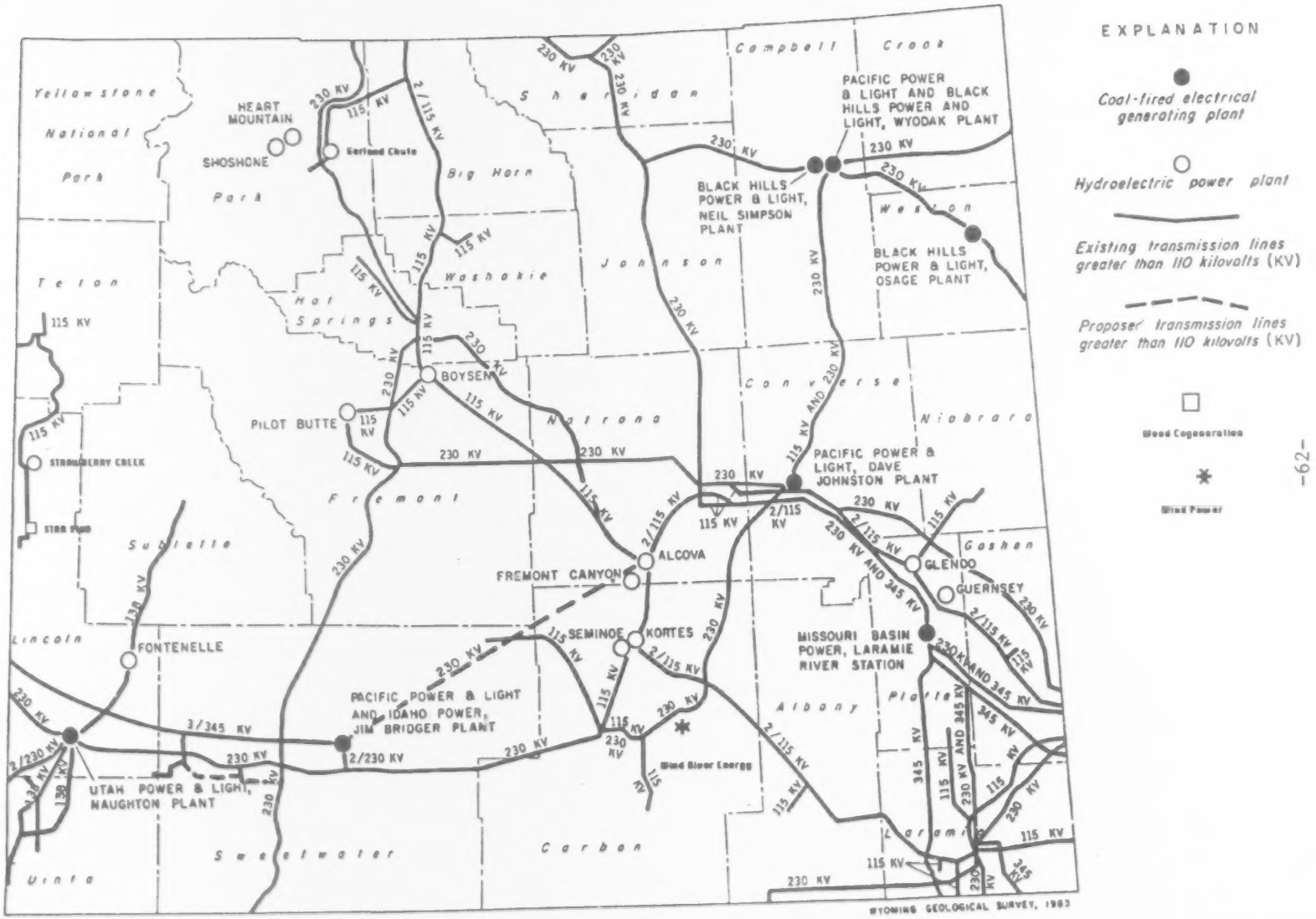
Wyoming mines produced 171,140,004 million gross tons of coal in 1989. The amount consumed within the state totaled 23,959,600 million tons, or 14% of the total.
Electrical generation within the state accounted for 22.3 million tons, 93% of the total. The remainder, 1.6 million tons, or 7%, was utilized in trona refining, coke manufacture, sugar refining, and institutional and domestic space heating. Campbell County is the leading coal producing County in Wyoming and the nation with 143.9 million tons in 1989. Sweetwater County is second in the state with 11.7 million tons, followed by Converse at 6.1, Lincoln at 4.7, Carbon at 4.2, Sheridan at .1, and Hot Springs with 52,000.

Coal consumption in the state follows the distribution of power plants with Sweetwater leading at 9.0 million tons, followed by Platte at 6.6 Lincoln at 2.0 Converse at 2.3, Campbell at 2.2 and Weston at .2.

Electricity

The capacity of electrical generating facilities is measured in kilowatts.
Electrical production is measured in hours of delivery; kilowatt hours or megawatt hours.

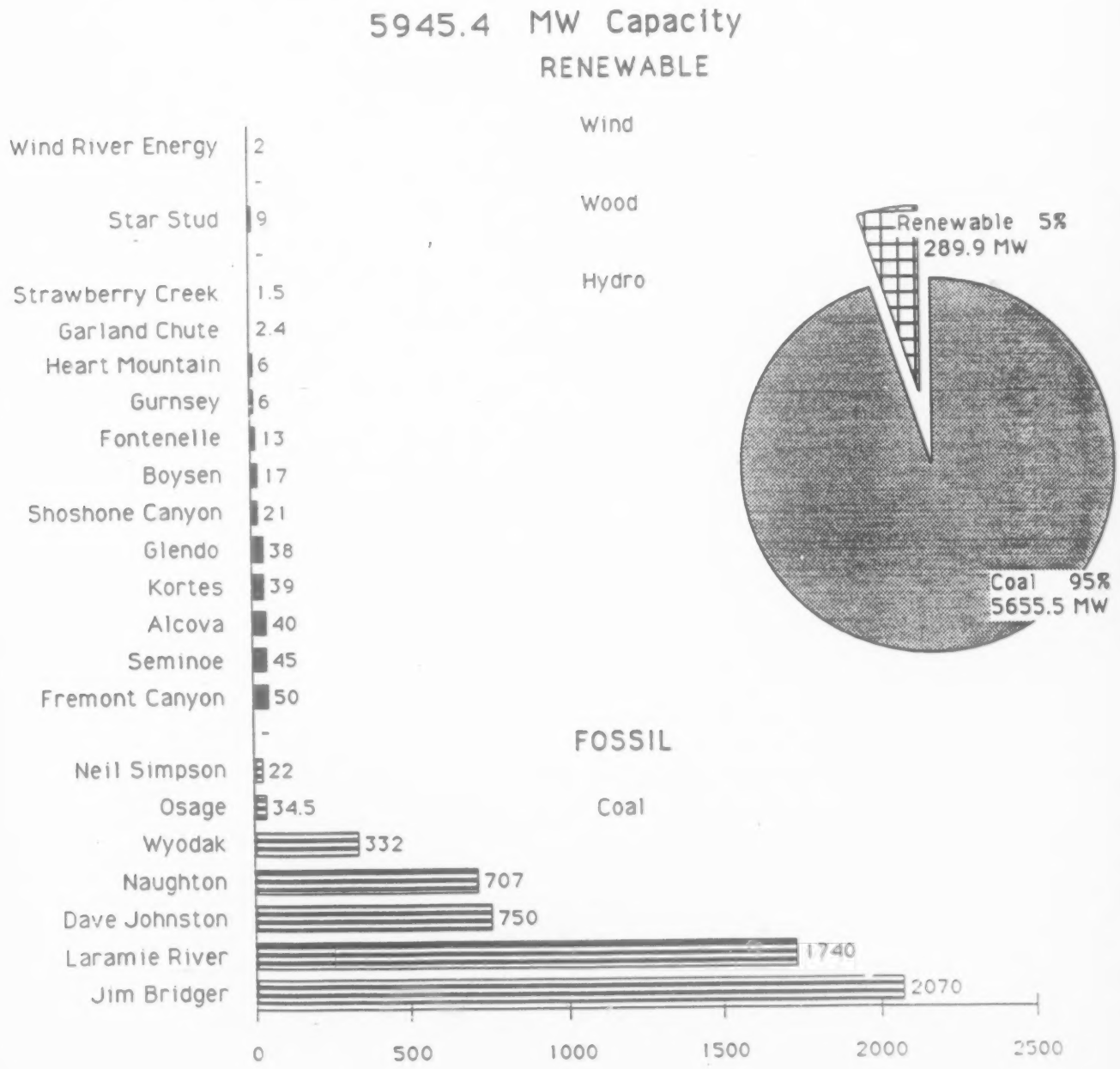
Based on annual reports to the Wyoming Public Service Commission's Utility Division, generating facilities in Wyoming delivered 36.69 billion kilowatt hours of electricity in 1989. This figure includes line losses and internal consumption. The Jim Bridger plant of Pacific Power and Light in SweetwaterCounty led state generating plants with 15.3 billion kilowatt hours produced, followed by the Laramie River Station of Tri-State Generation in Platte County with 11.8 billion KWH, Utah Power & Lights' Eva Naughton Plant in Lincoln Countty at 4.3 KWH, P.P. & L.'s Dave Johnston station in Converse County with 4.3 billion KWH, and Black Hills Power and Light Company's 3 stations in Campbell and Weston counties with 990 million KWH.

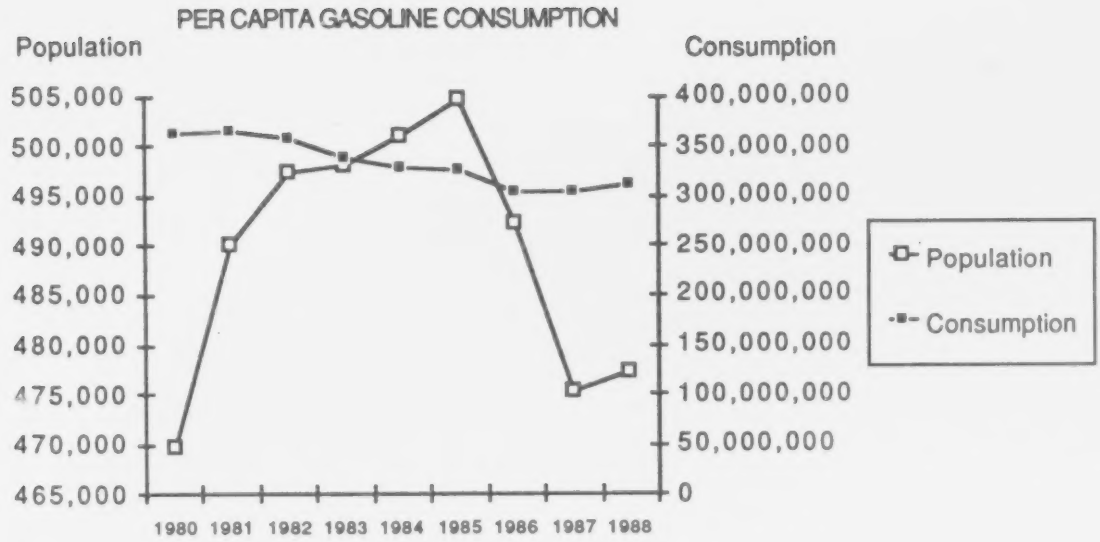


ELECTRICAL GENERATING PLANTS AND MAJOR TRANSMISSION LINES

WYOMING ELECTRICAL GENERATION

This chart illustrates the dominance of coal in the electrical generation industry of Wyoming. The hydro facilities are associated with water storage projects and are largely U.S. Bureau of Reclamation operations. The wind power facility has been sited, but is not operational as of this writing. The Star Stud operation utilizes timber mill wood wastes in a cogeneration facility.operating in the Bonneville Power Authority grid. The accompanying map points out the facilities' locations.





Natural Gas

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Consumption varies with population, reflecting use in space heating. The only two counties where natural gas is not generally available, Sublette and Teton counties, utilize propane as a primary heating fuel.

For comparative purposes, natural gas contains 1,000,000 BTU's per MCF per gallon.

Wyoming produced 471,363,924 taxable MCF of natural gas in 1988. Wyoming's consumption of 24,183,154 MCF is 5.2% of its production.

Gasoline 1988

County	Gallons
Albany	17,397,174
Big Horn	5,441,821
Campbell	20,624,251
Carbon	18,301,772
Converse	6,559,074
Crook	5,439,592
Fremont	19,917,715
Goshen	8,323,024
Hot Springs	3,138,278
Johnson	7,057,493
Laramie	44,080,694
Lincoln	7,920,637
Natrona	35,061,895
Niobrara	2,396,136
Park	15,903,398
Platte	6,070,677
Sheridan	14,875,926
Sublette	3,957,307
Sweetwater	29,943,671
Teton	13,161,264
Uinta	14,981,326
Washakie	5,245,431
Weston	4,197,338
TOTAL	310,995,894

Gasoline and Diesel

Wyoming's refineries have an annual capacity of 2.6 billion gallons of crude oil per year. Estimated capacity during 1988 was 80 percent, resulting in a through-put of 2.1 billion barrels. Approximately 50% of a refinery's output is gasoline, resulting in an approximate 1988 gasoline production in Wyoming of 1,005,000,000 gallons of gasoline. Wyoming consumption is 30% of that amount.

The following figures reflect gasoline sales, and as such include amounts purchased by vehicle users passing through the state as well as residents. There is no way to break out resident versus transient consumption, but nonresident gasoline use is quite significant. in that three major interstates traverse Wyoming's borders.

Diesel consumption is not compiled on a county by county basis. Consequently, we know approximately 131,515,913 gallons of diesel fuel were purchased in Wyoming in 1988, but no regional breakdown is possible.

An analysis of users of diesel fuel in Wyoming fall into several categories:

1. Agriculture.

2. The trucking industry.
   a. A significant transient component is involved here.

3. Railroads.
   a. Again, a transient component is significant.

4. Public transportation.

Diesel powered private automobiles are not a significant factor.

COUNTY MINERAL PRODUCTION AND VALUATION
1990

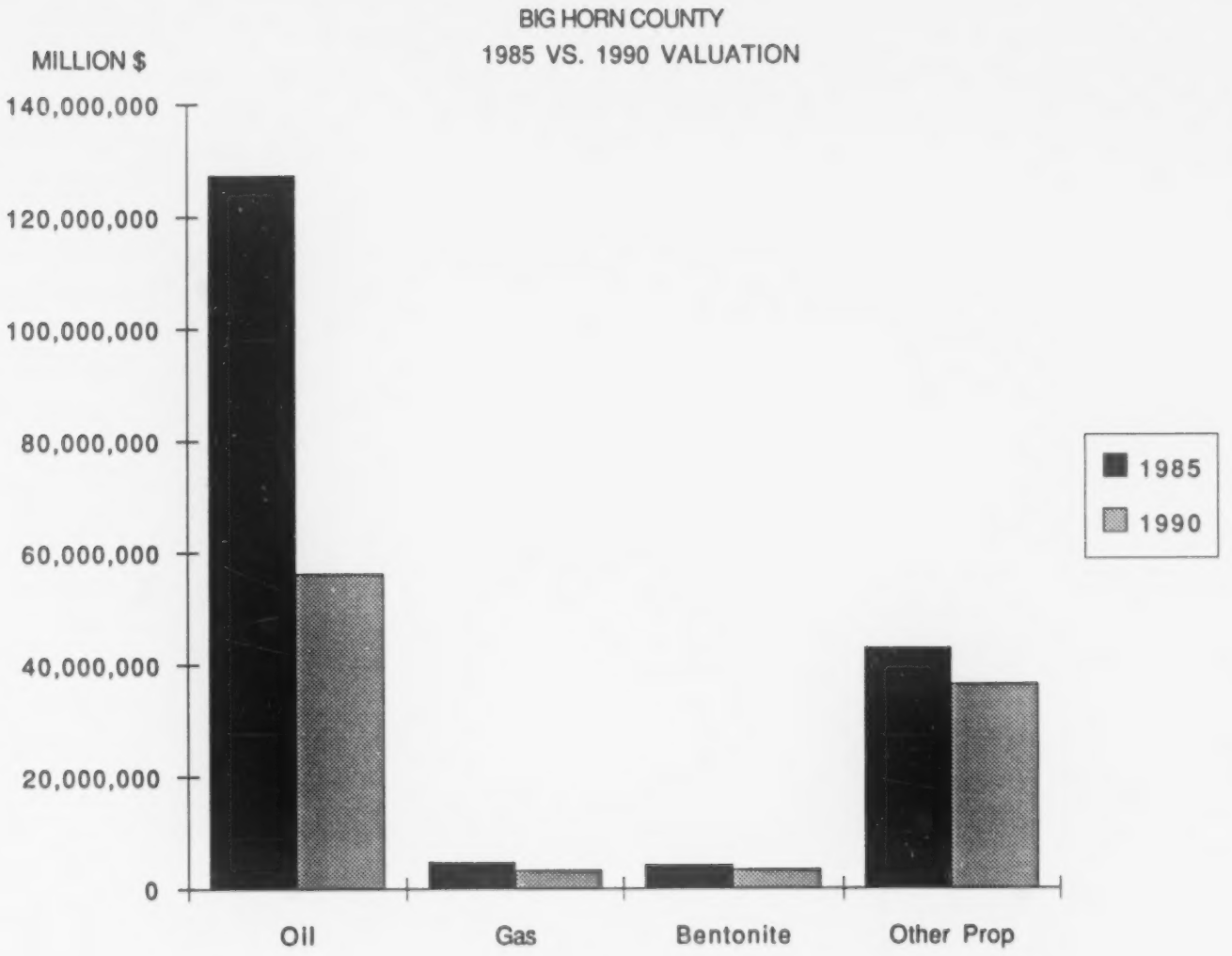
ALBANY COUNTY

Over 58% of Albany County's mineral valuation in 1990 was on crude oil, with gypsum, cement rock, and construction materials making up the remainder.

Oil production was up slightly in 1989, and valuation per barrel rose $2.82. These various factors combined to raise total 1990 mineral valuation in the county over 500 thousand dollars over 1989

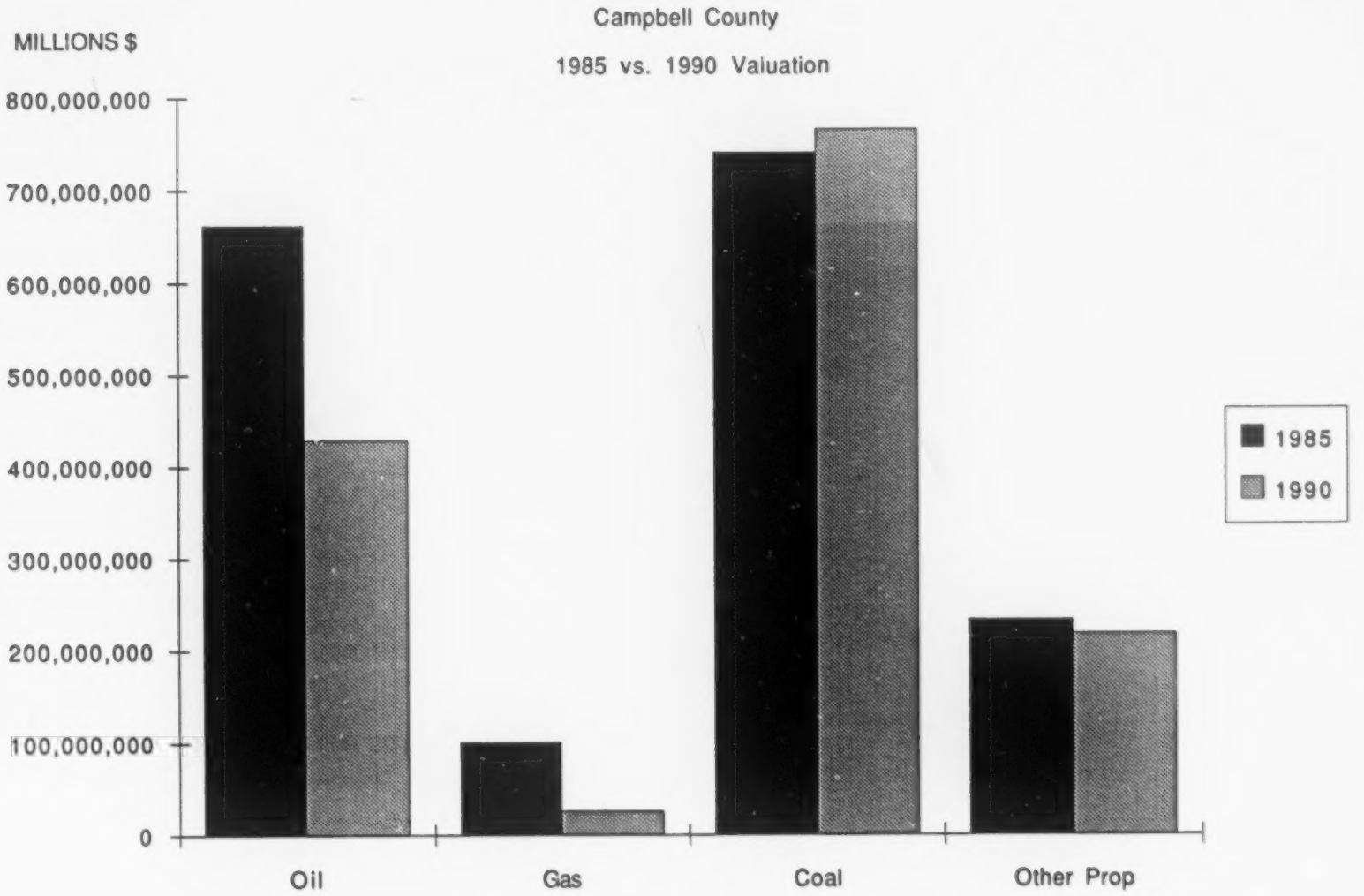
BIG HORN COUNTY

Big Horn County's dominant mineral product is crude oil, accounting for 87% of the county's mineral valuation in 1990. Production decreased by 46,000 barrels, but a $3.11 per barrel increase in unit value resulted in a valuation increase of 11 million dollars . Natural gas production significantly increased in 1989, and bentonite production rose by 180,000 tons. Gypsum production rose by 26,000 tons. Modest amounts of clay, sand and gravel were produced. in the county


BIG HORN COUNTY
1985 VS. 1990 VALUATION
MILLION $
140,000,000
120,000,000
100,000,000
80,000,000
60,000,000
40,000,000
20,000,000
0
Oil
Gas
Bentonite
Other Prop
1985
1990

CAMPBELL COUNTY

Campbell County leads Wyoming in oil and coal production, and is 7th in natural gas production. Oil production rose by 200 thousand barrels in 1989, and valuation rose by $3.27 per barrel. Coal production rose to a new high of nearly 144 million tons in 1989, 83% of Wyoming's total. county valuation rose by 35 million dollars despite a drop in the unit price of .08 cents per ton. Gas production fell by nearly 3 million MCF, resulting in a decrease in valuation of nearly 5 million dollars.


Campbell County
1985 vs. 1990 Valuation
MILLIONS $
800,000,000
700,000,000
600,000,000
500,000,000
400,000,000
300,000,000
200,000,000
100,000,000
0
Oil
Gas
Coal
Other Prop
1985
1990

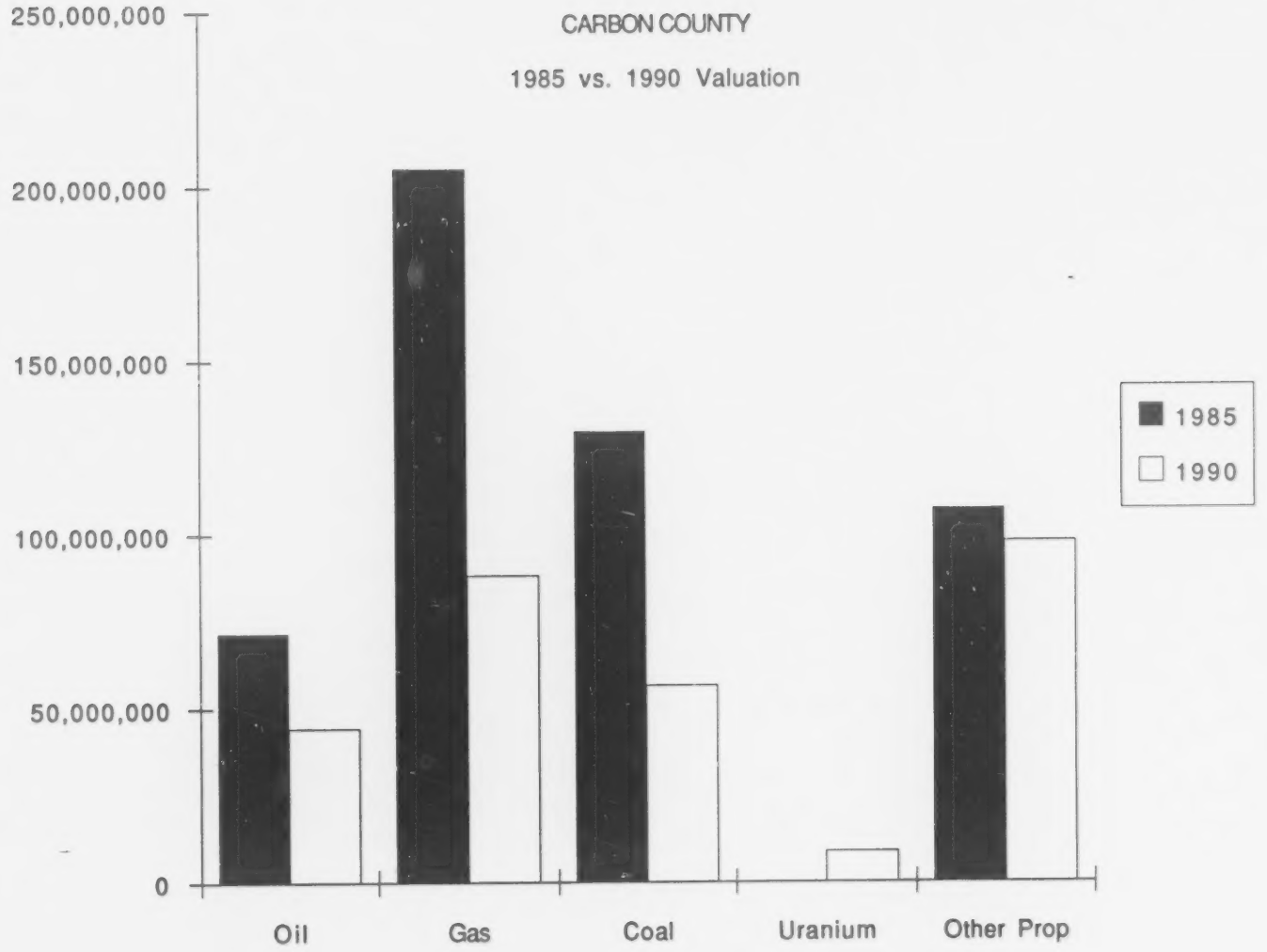
CARBON COUNTY

Natural gas was the most valuable county mineral commodity in1989, a total worth of 88 million dollars.

Carbon county produced 4.3 million tons of coal in 1989, up from 3.9 million tons in 1988 High mining costs in Carbon County will keep production at these modest levels.

Carbon County produced 467,000 tons of uranium ore in 1989.

Oil production was 3.0 million barrels.


CARBON COUNTY
1985 vs. 1990 Valuation
250,000,000
200,000,000
150,000,000
100,000,000
50,000,000
0
1985
1990
Oil
Gas
Coal
Uranium
Other Prop

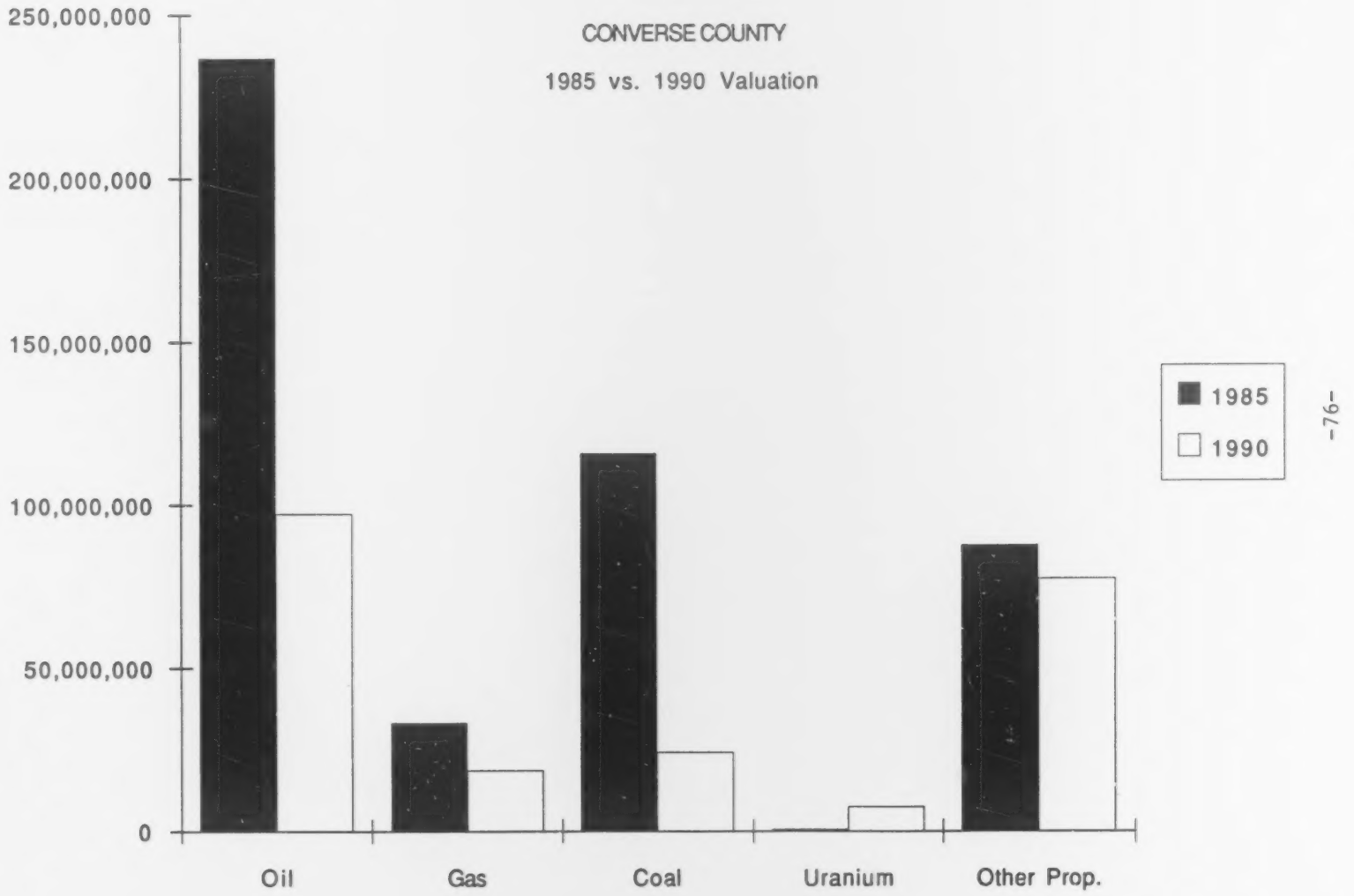
CONVERSE COUNTY

Oil production held steady in Converse County in 1989, at 5.3 million barrels. A valuation increase of $3.08 per barrel resulted in a valuation rise of 18 million dollars.

Natural gas production rose by 2.8 million MCF over 1988, but a valuation drop of 52 cents per MCF resulted in a valuation decrease of 4 million dollars.

Coal production in the county increased by 300,000 tons in 1989, reflecting planned increases in several of the states newest mines.

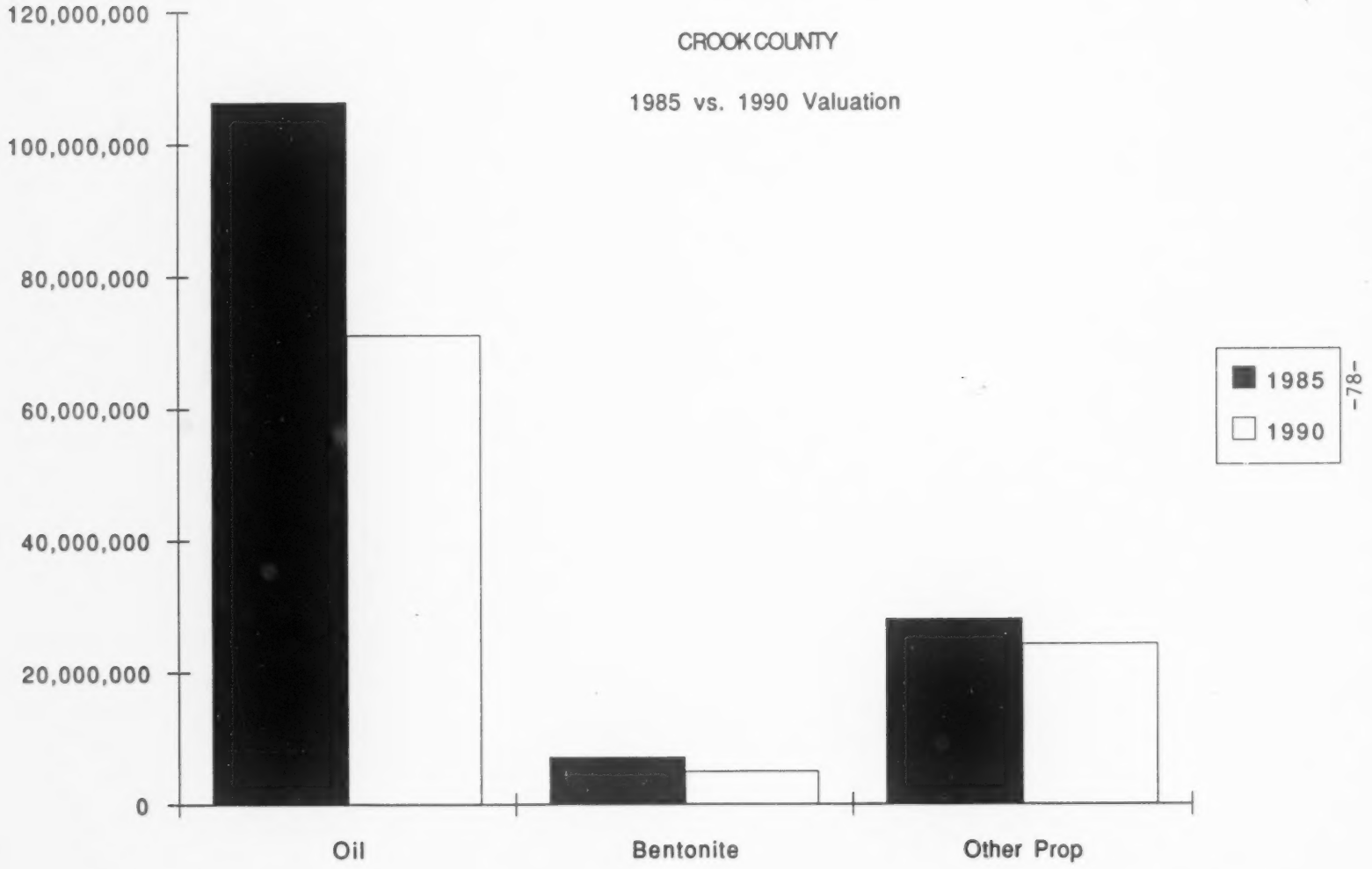
Some in-situ Uranium mining continues in the County.


CONVERSE COUNTY
1985 vs. 1990 Valuation
250,000,000
200,000,000
150,000,000
100,000,000
50,000,000
0
1985
1990
Oil
Gas
Coal
Uranium
Other Prop.

CROOK COUNTY

Oil production in Crook County rose by 200,000 barrels in 1989. Unit valuation rose by $2.21 per barrel, resulting in an oil valuation increase of nearly 12 million dollars. Oil accounts for 86% of the county's mineral valuation. Natural gas production increased by nearly a third in 1989, but this amounted to only 29,000 MCF.

Bentonite production again fell in 1989 by 123,000 tons.

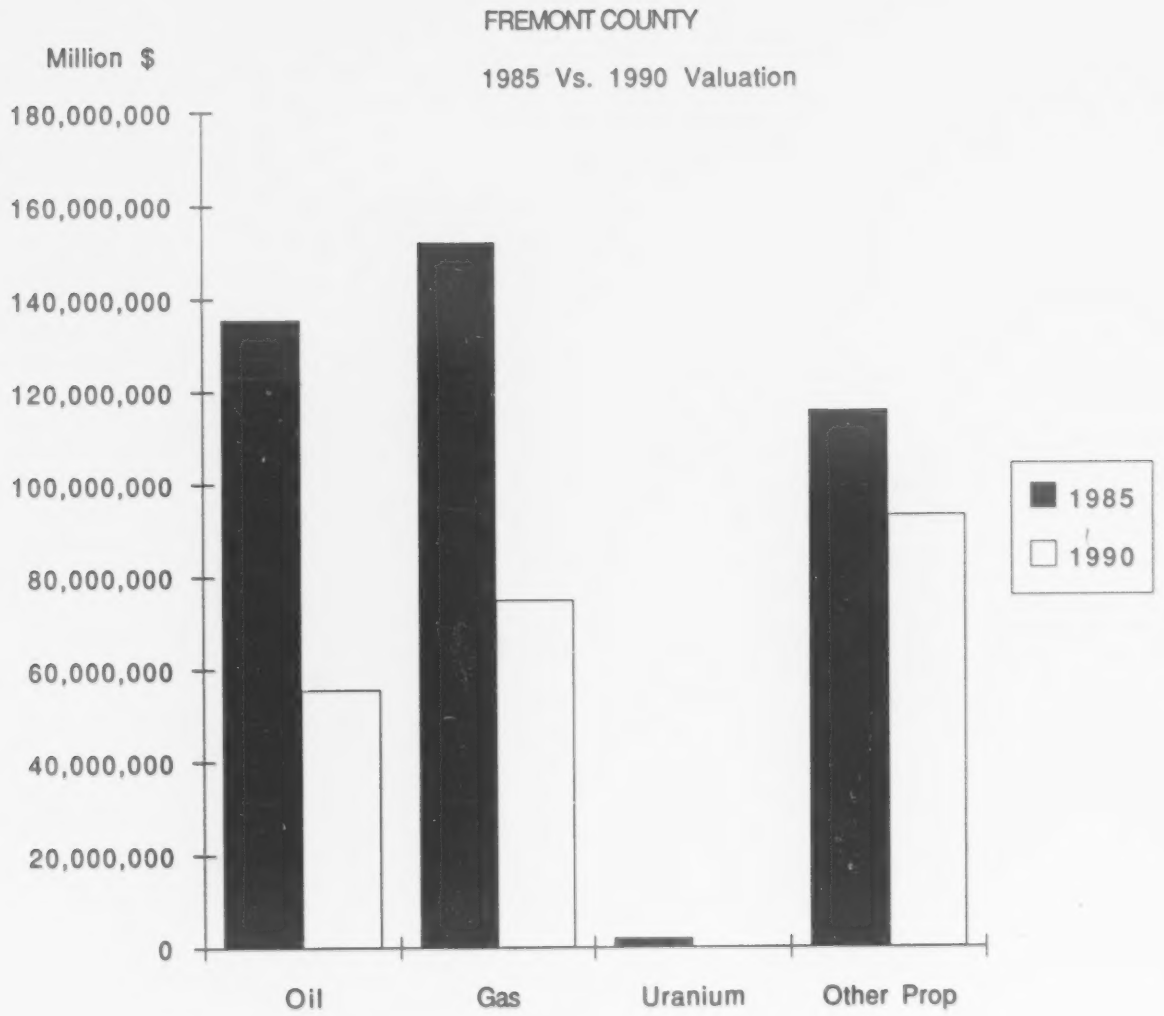

CROOK COUNTY
1985 vs. 1990 Valuation
120,000,000
100,000,000
80,000,000
60,000,000
40,000,000
20,000,000
0
1985
1990
Oil
Bentonite
Other Prop

FREMONT COUNTY

Oil production fell in Fremont County by almost 600,000 barrels in 1989 but unit valuation rose by $3.58, resuting in a valuation increase of over 5 million dollars.

Gas production rose by almost 7 million MCF, and unit valuation rose by $.23 per MCF, increasing valuation over 19 million dollars.

Uranium production in the county fell virtually to zero.


FREMONT COUNTY
1985 Vs. 1990 Valuation
Million $
180,000,000
160,000,000
140,000,000
120,000,000
100,000,000
80,000,000
60,000,000
40,000,000
20,000,000
0
Oil
Gas
Uranium
Other Prop
1985
1990

GOSHEN COUNTY

Goshen County mineral production consists of a small amount of oil and construction materials.

Its 1990 mineral valuation of 267,000 dollars was the smallest in the state.

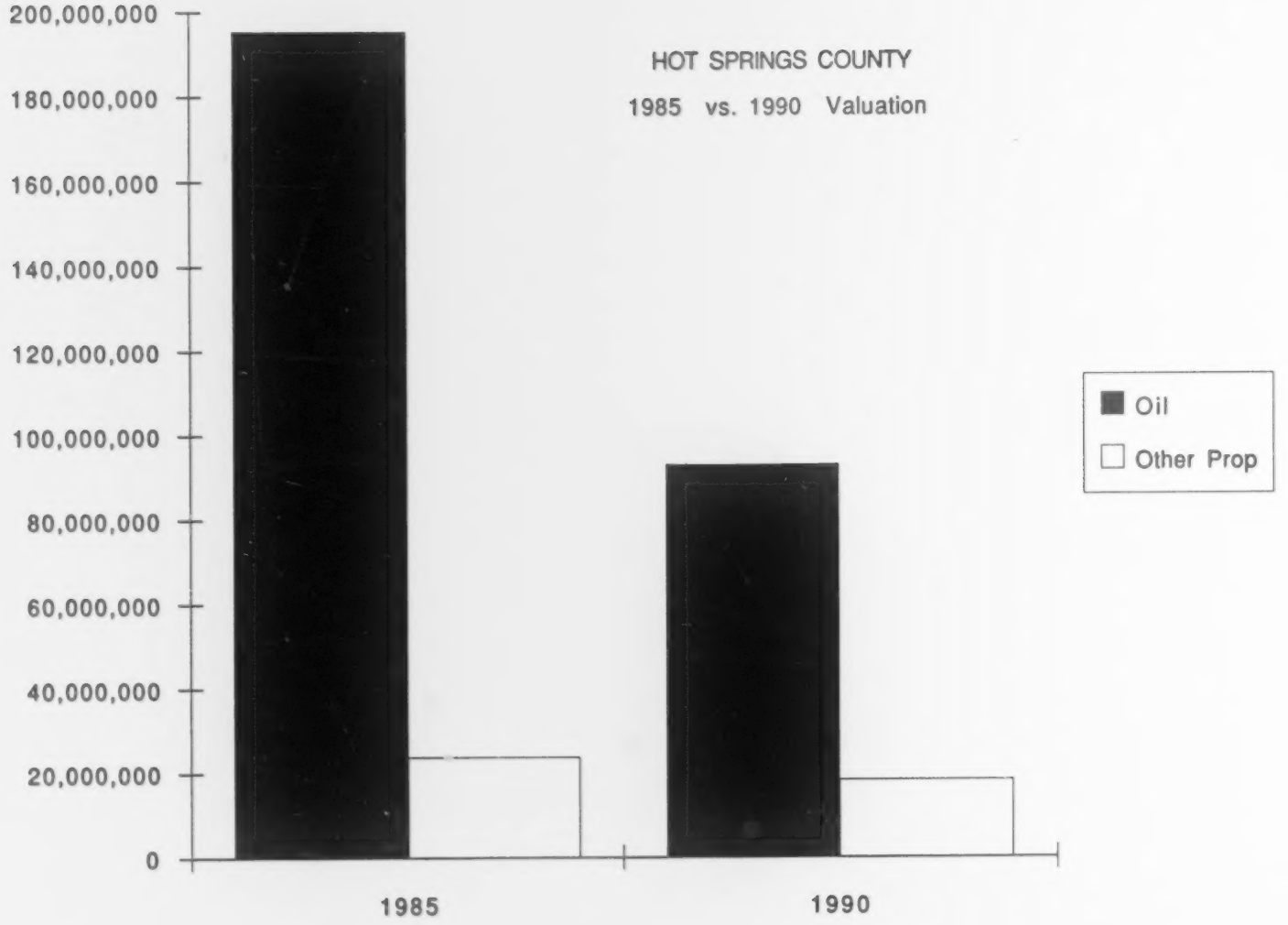
The county's oil is from low production stripper wells and has one of the higher unit valuations in the State, $18.03 per barrel for 1990 a rise of $3.24 from 1988

HOT SPRINGS COUNTY

Oil accounts for over 98% of Hot Springs county's mineral valuation. In 1989 production rose by 43,000 barrels, and a $1.57 per barrel rise in pri resulted in a valuation increase of over 11 million dollars.

Coal production at the Grass Creek Mine was 52,149 tons. The compan has filed applications to increase capacity to 700,000 tons over the next several years.

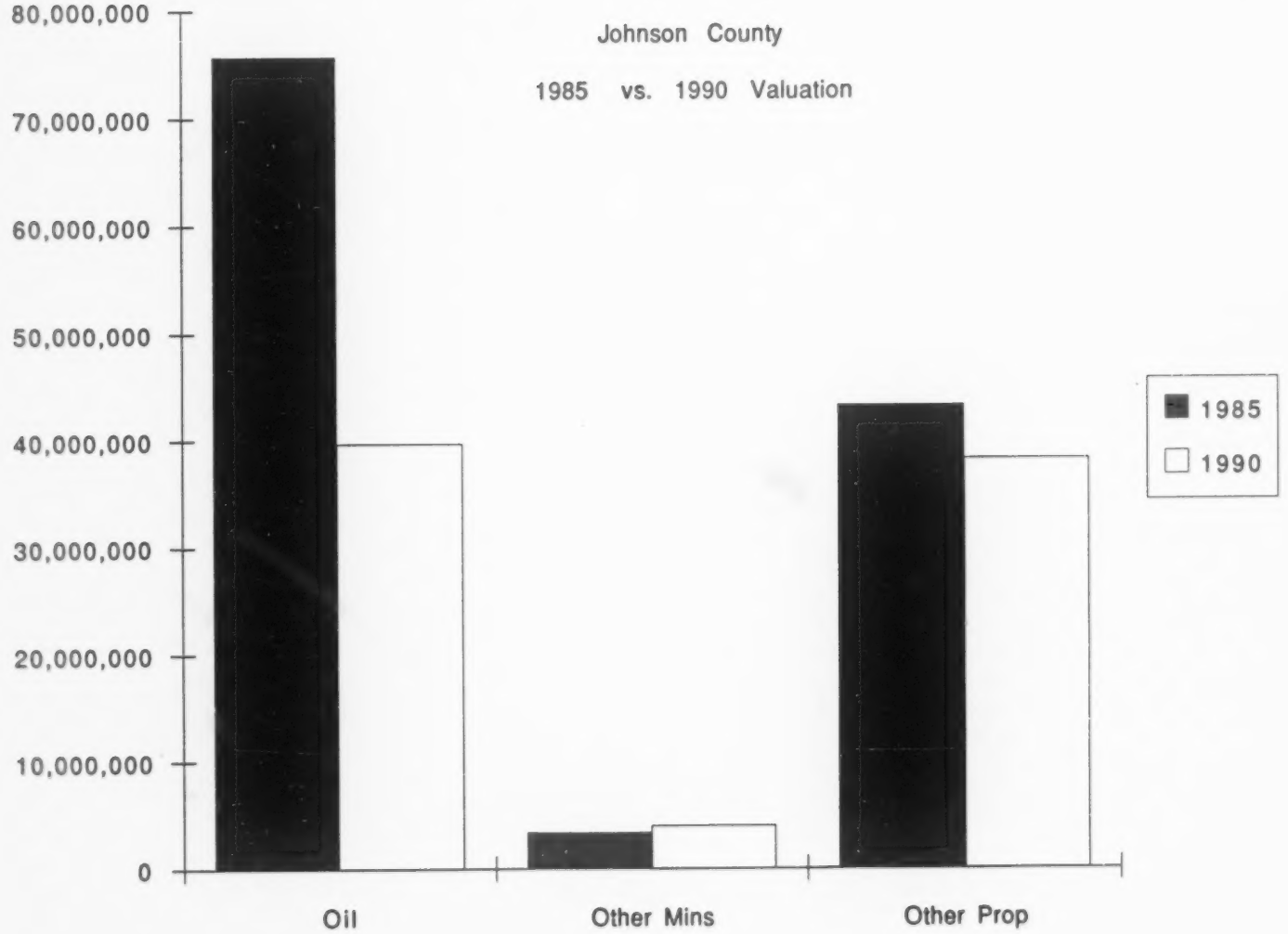
Natural gas production in the county held fairly steady at 217,000 MCF.


HOT SPRINGS COUNTY
1985 vs. 1990 Valuation
200,000,000
180,000,000
160,000,000
140,000,000
120,000,000
100,000,000
80,000,000
60,000,000
40,000,000
20,000,000
0
1985
1990
Oil
Other Prop

JOHNSON COUNTY

Oil accounted for 91% of Johnson County's mineral valuation in 1990. Production decreased by about 171,000 barrels, but valuation rose by over 4 million dollars. Unit valuation.rose by $2.98

Other mineral products of the county were,1,173,000 MCF of gas and 155,000 tons of bentonite.


Johnson County
1985 vs. 1990 Valuation
80,000,000
70,000,000
60,000,000
50,000,000
40,000,000
30,000,000
20,000,000
10,000,000
0
1985
1990
Oil
Other Mins
Other Prop

LARAMIE COUNTY

In 1989 oil production accounted for 75% of Laramie County's mineral valuation, with construction materials and a small quantity on natural gas accounting for all the rest .

Oil production in the county fell by 24,000 barrels, but valuation increased by $3.49 per barrel. New horizontal drilling finds should increase county production significantly.

The county valuation of 2,178,993 dollars for construction materials is the largest amount of any county in the state.

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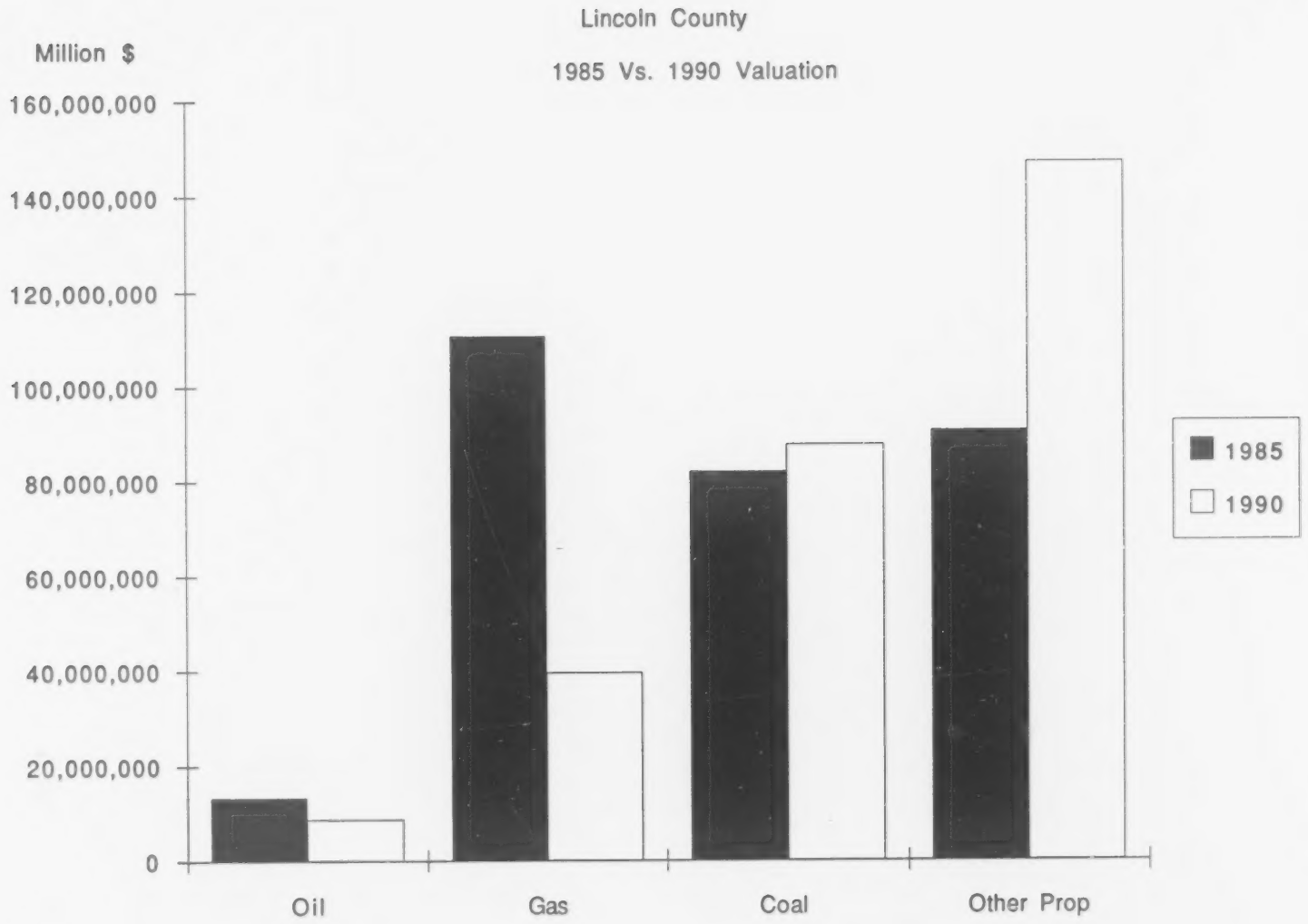
LINCOLN COUNTY

Lincoln County has been a coal producer for 110 years. In 1989, 4,776 tons were mined, a decrease of 200,000 tons over 1988. Additional production from the FMC Skull Point Mine and possibly a Rocky Mountain Energy operation may raise this total in future years.

Natural gas accounted for 29% of Lincoln County's 136 million dollar mineral valuation in 1990. The county's location on the eastern ed of the Overthrust Belt accounts for its large gas production. County oil production rose by 32,000 barrels in 1989 The Exxon LaBarge Project has helped sparked a rise in Lincoln County gas output.

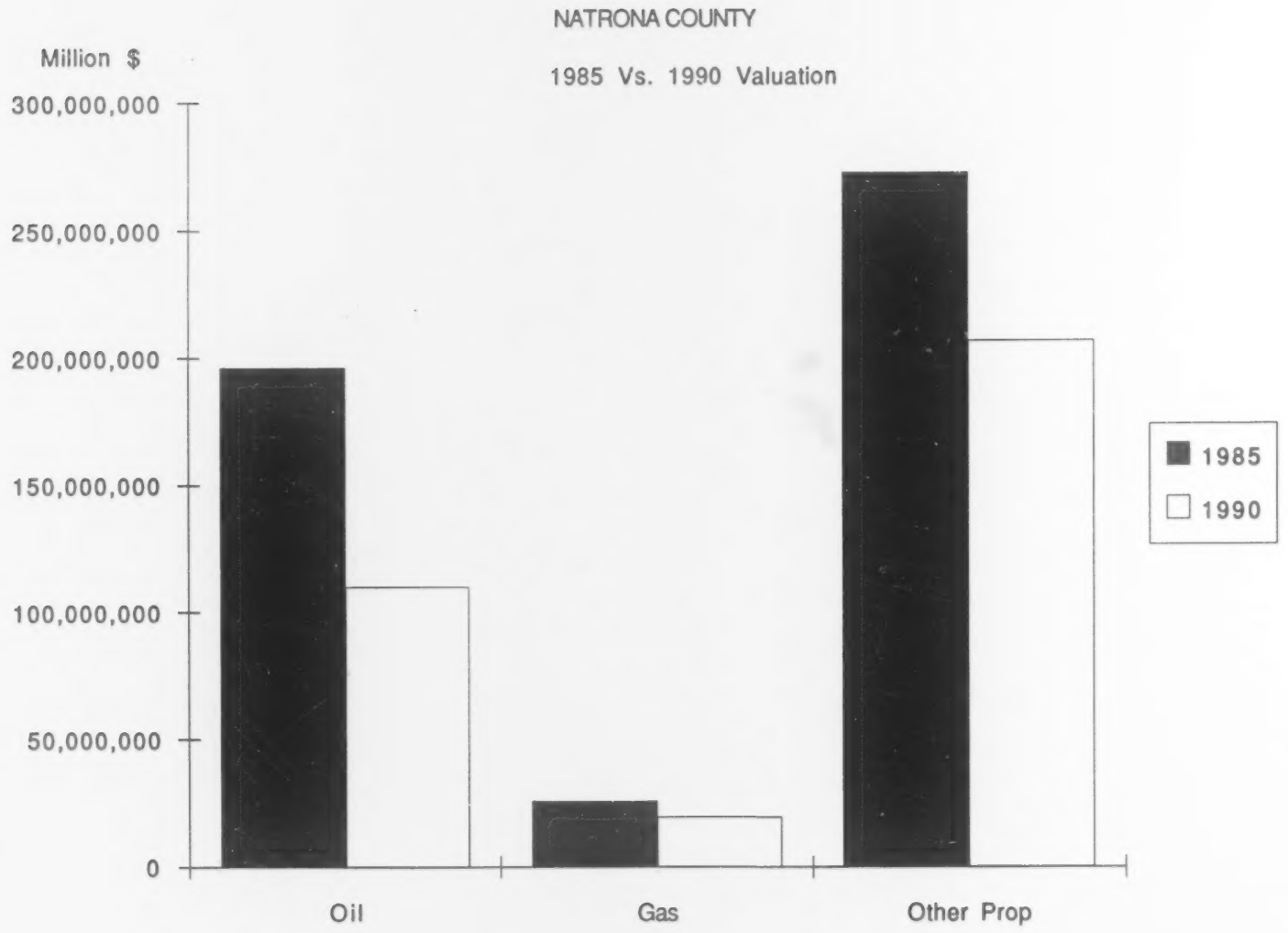

Lincoln County
1985 Vs. 1990 Valuation
Million $
160,000,000
140,000,000
120,000,000
100,000,000
80,000,000
60,000,000
40,000,000
20,000,000
0
Oil
Gas
Coal
Other Prop
1985
1990

NATRONA COUNTY

Oil production in Natrona County fell by 219,000 barrels in 1989. A rise in unit valuation of $2.90, however, resulted in a gain of nearly 15 million dollars in valuation.

Bentonite production rose slightly in 1989, but considering the small amount currently mined in Natrona County, no trends are discernable.

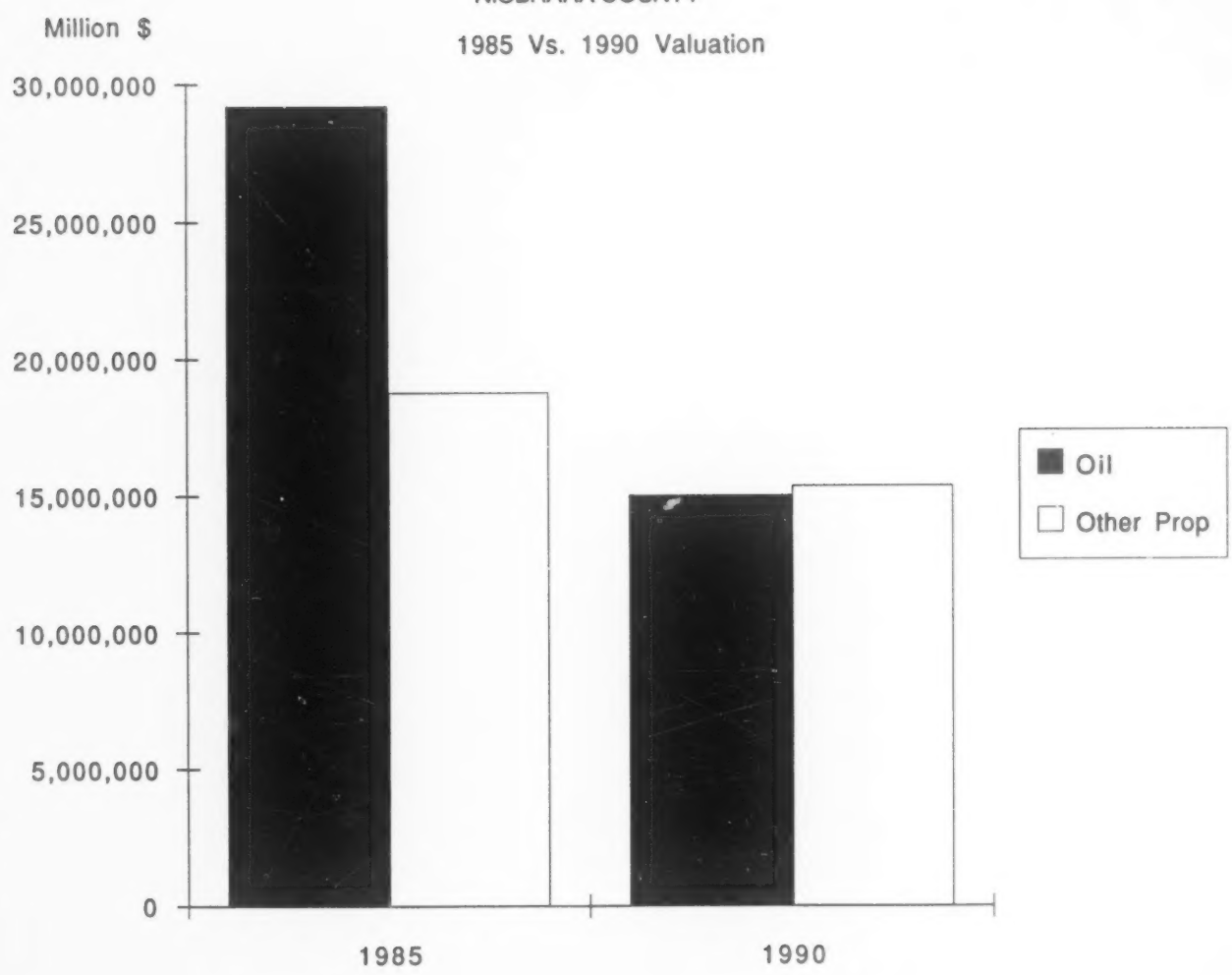
Other county mineral products are sodium sulfate and construction materials.


NATRONA COUNTY
1985 Vs. 1990 Valuation
Million $
300,000,000
250,000,000
200,000,000
150,000,000
100,000,000
50,000,000
0
Oil
Gas
Other Prop
1985
1990

NIOBRARA COUNTY

Niobrara County's most important mineral commodity is crude oil. In · crude oil accounted for 95% of the county's mineral valuation. Productior rose from 778,556 to 838,504 barrels, and a unit value increase of $2.37 reflected in a valuation rise of 3,500,000 dollars.

Natural gas production rose by 10,000 MCF, but such a small quantity cannot reliably indicate longer range trends.

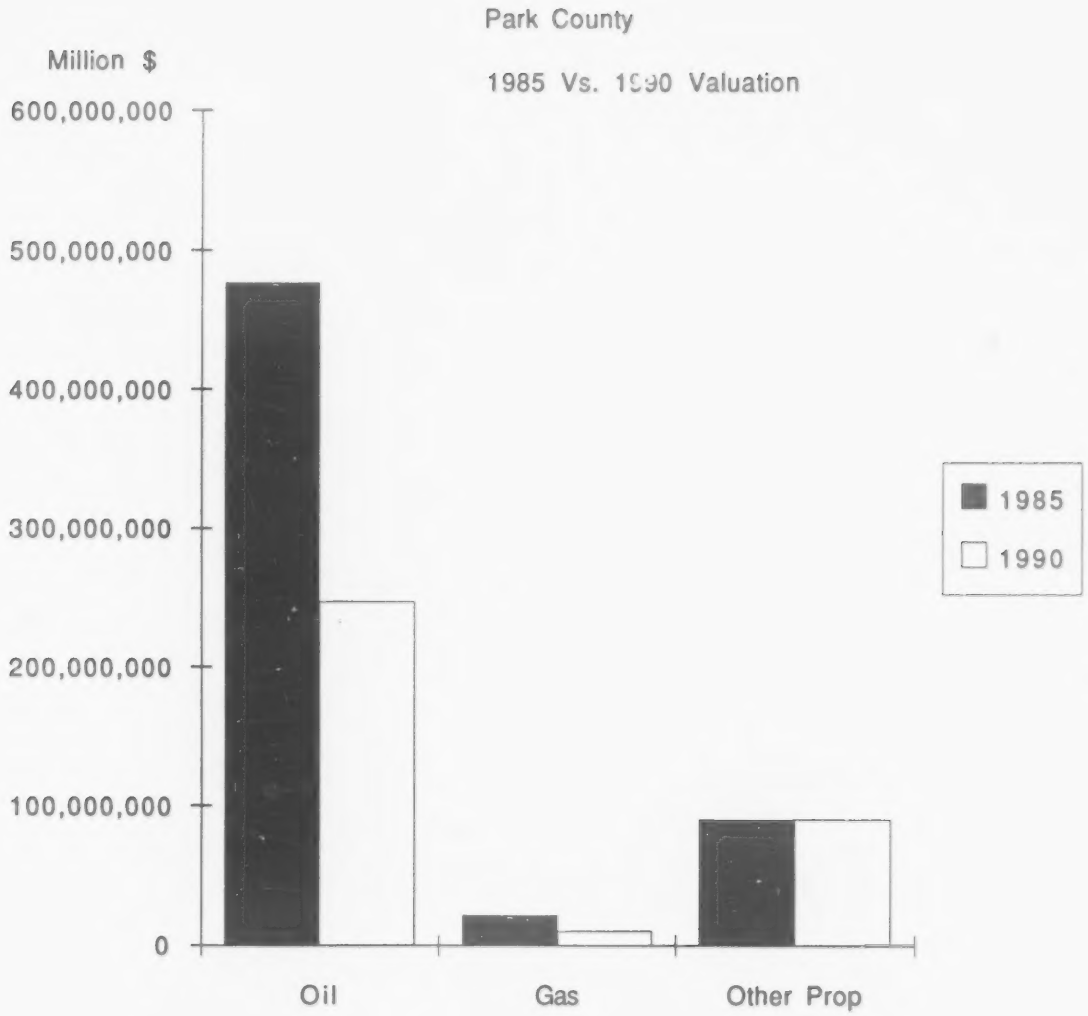

NIOBRARA COUNTY
1985 Vs. 1990 Valuation
Million $
30,000,000
25,000,000
20,000,000
15,000,000
10,000,000
5,000,000
0
1985
1990
Oil
Other Prop

PARK COUNTY

Park County was in second place behind Campbell County in 1989 with output of 16,954,943 barrels of oil. This was a decrease of 1,674,000 barrels compared to 1988. Production will continue to decline in the long as old giant fields like Oregon Basin continue to be depleted, regardless o market conditions. Oil production accounted for 95% of the county's mine valuation and 71% of total valuation. Unit valuation rose by $2.71 per ba

Gas production fell by 1,400,000 MCF.

Gypsum production was 148000 tons in 1989, 4,000 tons more than 19


Park County
1985 Vs. 1990 Valuation
Million $
600,000,000
500,000,000
400,000,000
300,000,000
200,000,000
100,000,000
0
Oil
Gas
Other Prop
1985
1990

PLATTE COUNTY

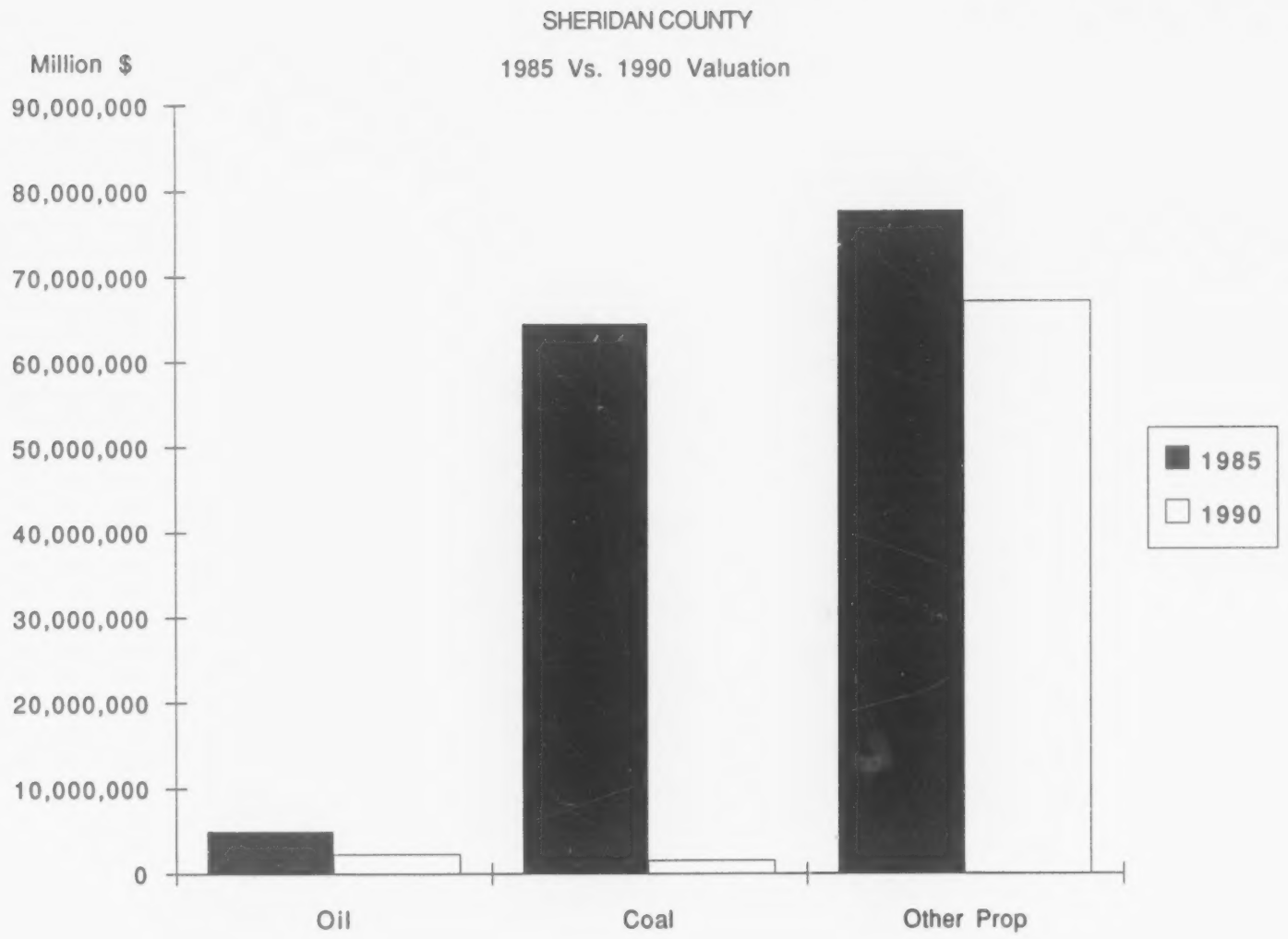
The county's mineral valuation, $618,098, comes from Guernsey Stone' dolomite quarry, Basin Engineering's marble quarry and various sand and gravel operations.

SHERIDAN COUNTY

Coal production in Sheridan County fell by over 830,000 tons in 1989. Coal unit valuation decreased by $12.02 per ton. The Peter Kiewit and Sons' Big Horn Mine sharply curtailed activity when its contract with Commonwealth Edison expired at the end of 1988. Ninty percent of the mineral valuation of the county came from this mine's production.

Sheridan County's small oil production increased by 18,000 barrels in 1989.

Construction materials, including scoria, accounted for 65,166 dollars of valuation.

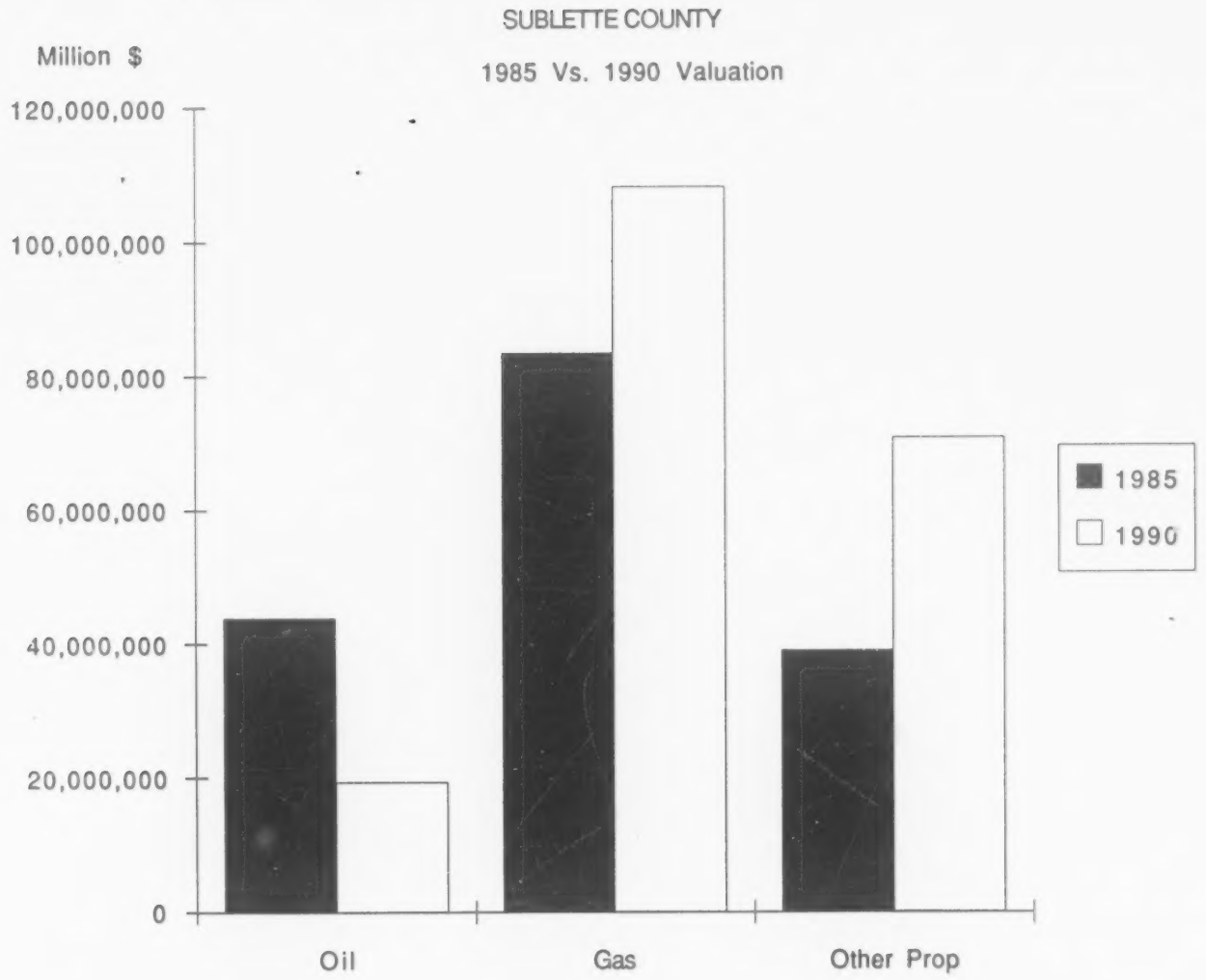

SHERIDAN COUNTY
1985 Vs. 1990 Valuation
Million $
90,000,000
80,000,000
70,000,000
60,000,000
50,000,000
40,000,000
30,000,000
20,000,000
10,000,000
0
Oil
Coal
Other Prop
1985
1990

SUBLETTE COUNTY

Natural gas was Sublette County's most important mineral product in 1989, with over 157 million MCF produced with a valuation of over 61 million dollars.

This very large increase reflects activity at the Riley Ridge Project w is now reaching full scale operation.

Oil production fell slightly in 1989 with a loss of seven thousand barr Liquids stripped at the new processing plants, plus the possibility of new Overthrust discoveries, should fuel an upward trend.in production


SUBLETTE COUNTY
1985 Vs. 1990 Valuation
Million $
120,000,000
100,000,000
80,000,000
60,000,000
40,000,000
20,000,000
0
Oil
Gas
Other Prop
1985
1990

SWEETWATER COUNTY

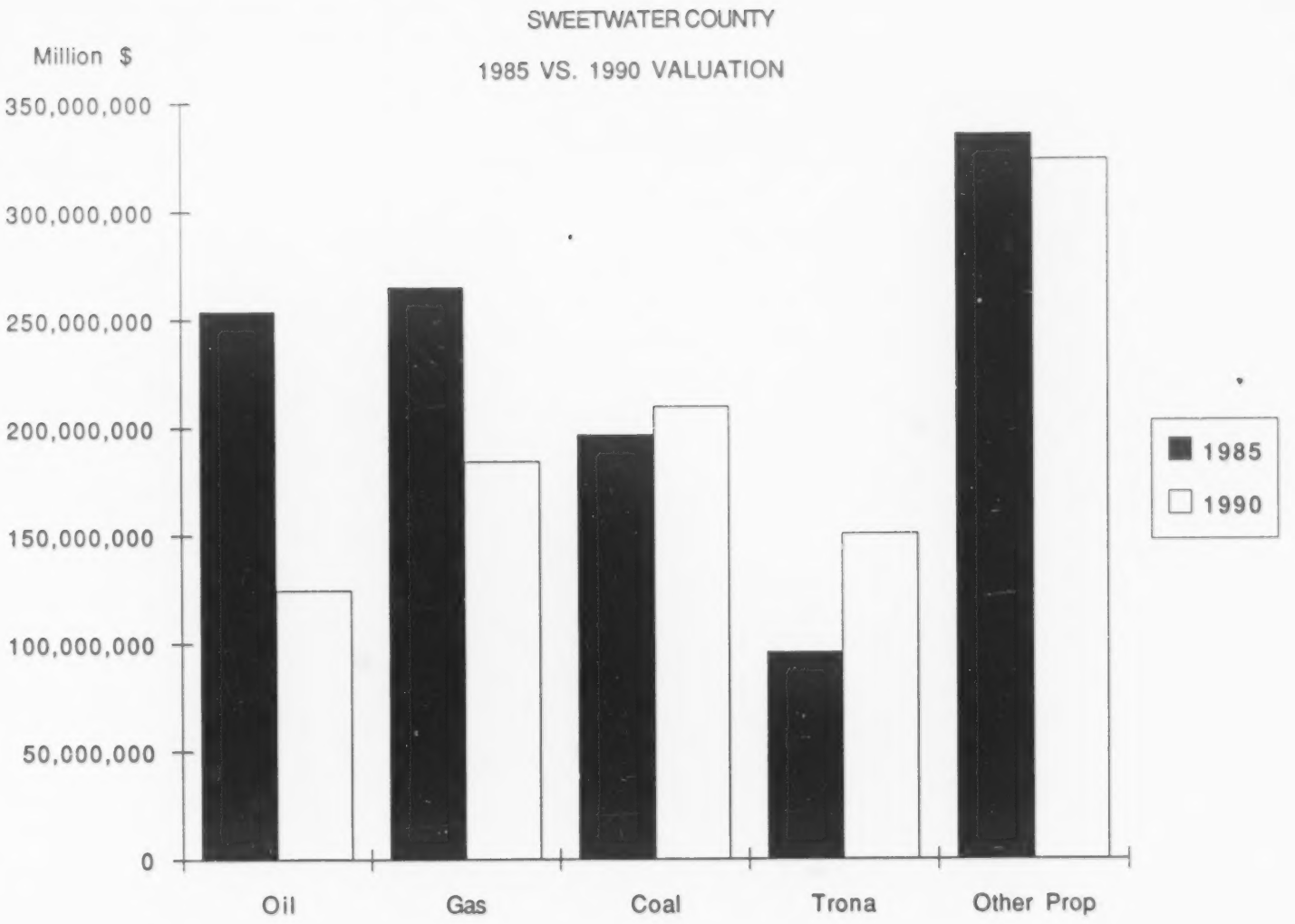
Sweetwater County has significant production of oil, gas, coal, and tro and these plus sand and gravel combine for a total valuation on productio over 668 million dollars, second largest in the State.

Coal is the most valuable product, accounting for 31% of the County mineral valuation and 21% of the total valuation. Production in 1989 wa down 400,000 tons.

Natural gas is the second most valuable mineral commodity in the coun accounting for 27% of the mineral valuation.

Trona is produced only in Sweetwater County, and is third behind coal gas in valuation at $150,600,216 dollars. Production was up by 1,200,00 tons in 1989

Sweetwater County is the fourth largest oil producer in the State. Production of 6,839,000 barrels was responsible for 19% of the 1990 co mineral valuation .


SWEETWATER COUNTY
1985 VS. 1990 VALUATION
Million $
350,000,000
300,000,000
250,000,000
200,000,000
150,000,000
100,000,000
50,000,000
0
Oil
Gas
Coal
Trona
Other Prop
1985
1990

TETON COUNTY

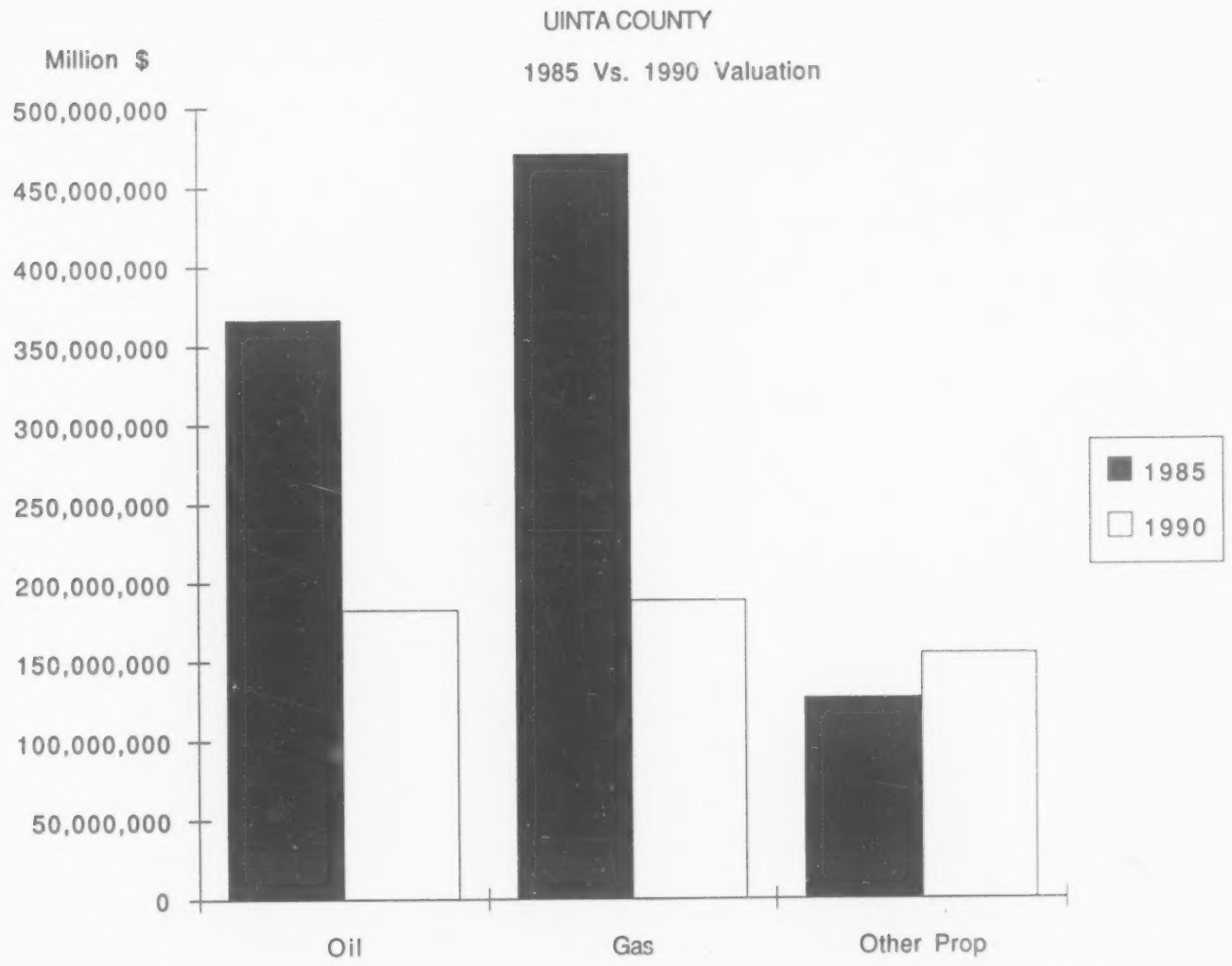
Teton County is one of two counties in Wyoming which had no oil or gas production in 1989. Several exploration leases and permits have been let the county, and several wells have been drilled in the past, but whether a production will result from this activity remains to be seen.

The only mineral produced in Teton County in 1989 was 365,932 dollar worth of sand and gravel.

UINTA COUNTY

Uinta County has been the main benefactor of Overthrust Belt oil and gas activity. In 1970 the county produced 31,000 barrels of crude oil while in 1989 the total was 9,593,687 barrels, third in the State behind Campbell and Park Counties.

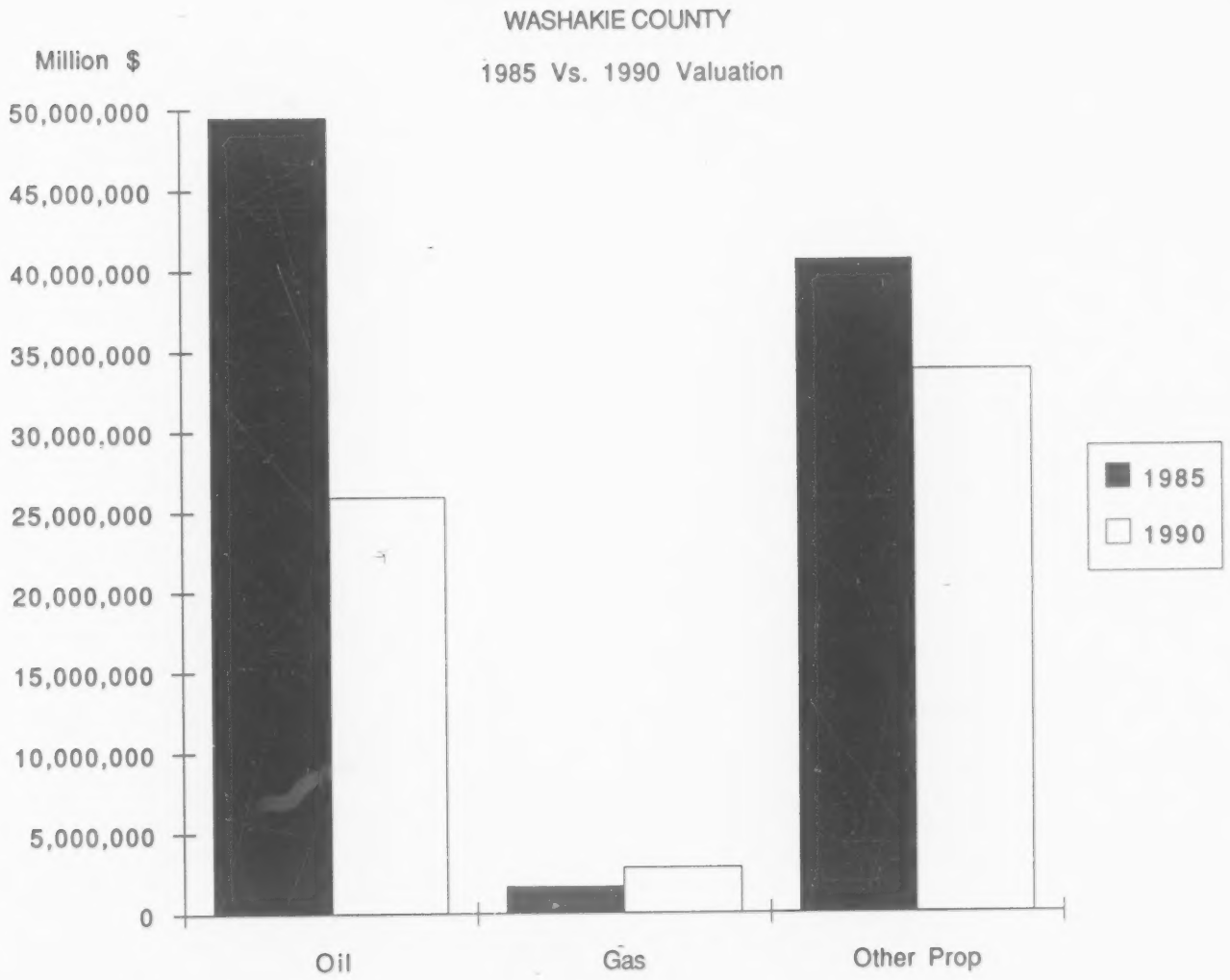
The increase in natural gas production has been even more dramatic, from 3.4 million MCF to 186 million MCF, the largest total in the State. Uinta County valuation on oil and gas production was over 370 million dollars in 1990, 70% of the total county valuation.


UINTA COUNTY
1985 Vs. 1990 Valuation
Million $
500,000,000
450,000,000
400,000,000
350,000,000
300,000,000
250,000,000
200,000,000
150,000,000
100,000,000
50,000,000
0
Oil
Gas
Other Prop
1985
1990

WASHAKIE COUNTY

Oil production showed a decrease of 153,000 barrels in 1989. Natural gas production fell by 161,000 MCF.

Bentonite production in the county was 36,482 tons, down from 54,119 tons in 1988.


WASHAKIE COUNTY
1985 Vs. 1990 Valuation
Million $
50,000,000
45,000,000
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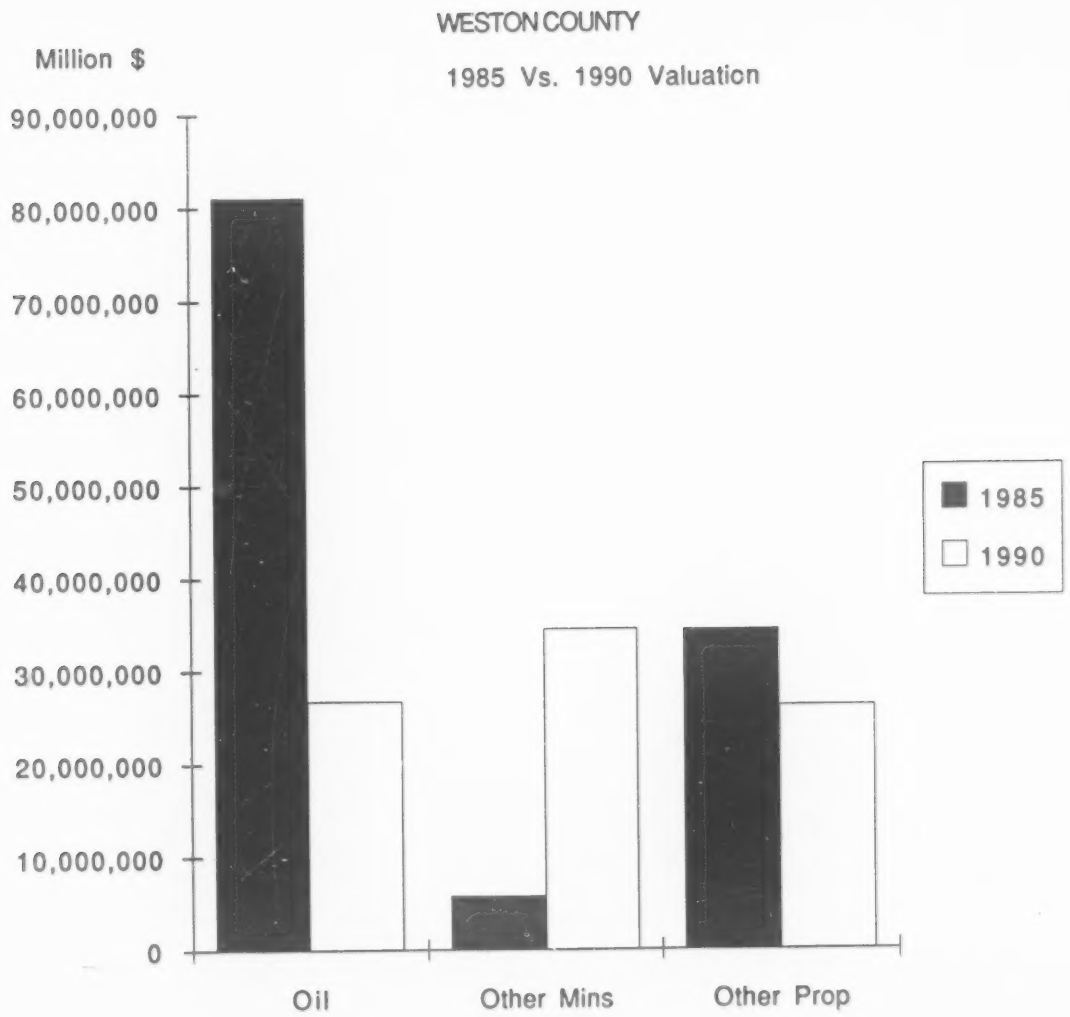
5,000,000
0
Oil
Gas
Other Prop
1985
1990

WESTON COUNTY

Oil production in the county dropped by 287,000 barrels in 1989, continuing a trend first appearing in the 1960's. Considering the age of Weston County's oil fields, no reversal of this downward slope is likely.

Natural gas production rose by 37,000 MCF, while unit valuation remained the same, resulting in an increase in valuation of 278,000 dollars.

Bentonite production in the county fell by about 10,000 tons.


WESTON COUNTY
1985 Vs. 1990 Valuation
Million $
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80,000,000
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1985
1990
Oil
Other Mins
Other Prop

WYOMING MINERAL PRODUCTION AND VALUATION
1985-1989

County	Oil (Bls)	Gas (MCF)	Coal (Tons)	Uranium (Tons)	Bentonite (Tons)	Trona (Tons)	Gypsum (Tons)
Albany	153,666						
Big Horn	4,654,964	1,447,968			901,561		175,512
Campbell	24,825,561	25,915,533	109,202,078				
Carbon	2,661,154	45,715,485	3,180,375	241,057			
Converse	8,888,482	33,202,177	3,151,197	225,323			
Crook	5,487,568	66,652			1,176,096		
Fremont	4,859,046	39,721,326		153,587			
Goshen	23,417						
Hot Springs	7,211,881	218,489	31,208				
Johnson	2,065,602	520,366			254,831		
Laramie	580,271	64,969					
Lincoln	539,375	23,639,001	4,320,225				
Natrona	10,833,972	7,811,090					
Niobrara	956,203	323,606					
Park	20,245,002	5,650,095			927		172,652
Platte							
Sheridan	213,002	9,926	2,362,539				
Sublette	1,479,452	27,180,096					
Sweetwater	8,307,887	80,251,435	12,857,582			10,776,304	
Teton							
Uinta	13,714,256	116,540,107					
Washakie	2,036,387	1,927,947			72,556		
Weston	2,435,386	1,820,346			148,642		
Total	122,172,534	412,026,614	135,105,204	619,967	2,554,613	10,776,304	348,164

1986 Valuation on 1985 Production

County	Oil	Gas	Coal	Uranium	Bentonite	Trona	Misc.	Total
Albany	$3,791,481						$93,079	$3,884,560
Big Horn	$109,186,837	$3,444,593			$3,586,624		$608,765	$116,826,819
Campbell	$599,786,073	$63,709,828	$736,704,572				$91,993	$1,400,292,466
Carbon	$62,962,049	$167,596,863	$83,053,397	$12,103,697			$362,620	$326,078,626
Converse	$228,999,961	$40,639,795	$18,952,799	$4,357,686			$126,106	$293,076,347
Crook	$128,537,254	$19,048			$3,444,670		$374,925	$132,375,897
Fremont	$116,801,851	$149,013,458		$454,733			$118,160	$266,388,142
Goshen	$601,758						$74,279	$676,037
Hot Springs	$171,621,268	$585,372	$611,365				$24,662	$172,842,667
Johnson	$77,463,336	$1,557,267			$554,770		$186,490	$79,761,863
Laramie	$1,494,444,512	$103,646					$1,741,915	$16,790,073
Lincoln	$13,349,400	$85,430,430	$86,523,549				$209,837	$185,513,216
Natrona	$184,112,301	$28,070,415			$65,663		$335,266	$212,583,645
Niobrara	$24,297,505	$949,871					$48,729	$25,296,105
Park	$467,007,353	$15,843,071			$17,208		$839,922	$483,707,554
Platte							$1,902,628	$1,902,628
Sheridan	$5,139,091	$24,391	$58,388,953				$106,661	$63,659,096
Sublette	$37,000,068	$58,355,766					$343,891	$95,699,725
Sweetwater	$215,013,562	$217,083,093	$272,126,000			$96,389,980	$750,314	$801,362,949
Teton							$179,052	$179,052
Uinta	$316,630,268	$399,602,011					$538,554	$716,770,833
Washakie	$49,668,606	$1,187,277			$210,412		$34,342	$51,100,637
Weston	$62,446,786	$5,029,423			$611,116		$67,626	$68,154,951
TOTAL	$2,889,361,320	$1,238,245,618	$125,636,635	$16,916,156	$8,490,463	$96,389,980	$9,159,716	$5,514,923,888
% of Total	52	22	23	0.4	0.3	2	0.3	

1986 Unit Valuation

County	Oil $/bbl	Gas $/MCF	Coal $/Ton	Uranium $/Ton	Bentonite $/ton	Trona $/Ton	Gypsum $/Ton
Albany	24.67						
Big Horn	23.46	$2.38			3.98		3.25
Campbell	24.16	2.46	6.75				
Carbon	23.66	3.67	26.11	50.21			
Converse	25.76	1.22	6.01	19.34			
Crook	23.42	0.29			2.93		
Fremont	24.04	3.75		29.61			
Goshen	25.7						
Hot Springs	23.8	2.66	19.59				
Johnson	25.27	2.99			2.18		
Laramie	25.75	1.6					
Lincoln	24.75	3.61	20.03				
Natrona	16.99	3.59			2.15		
Niobrara	25.41	2.94					
Park	23.07	2.81			4.3		3.25
Platte							
Sheridan	24.13	2.46	24.71				
Sublette	25.01	2.15					
Sweetwater	25.88	2.71	21.16			8.94	
Teton							
Uinta	23.09	3.43					
Washakie	24.39	0.62			2.91		
Weston	25.64	2.76			4.11		
State Average	23.46	3.01	9.31	30.96	3.28	8.94	3.25
Increase or							
Decrease over	-3.21	-0.31	-0.47	17.65	-1.31	0.21	0.31
1985							

			1986 Production				
County	Oil (Bbls)	Gas (MCF)	Coal (Tons)	Uranium (Tons)	Bentonite (Tons)	Trona (Tons)	Gypsum (Tons)
Albany	120,398						19,377
Big Horn	3,894,863	1,449,872			4,081,092		860,673
Campbell	24,558,504	26,721,731	103,801,604				
Carbon	2,426,384	34,233,999	2,040,723	226,821			
Converse	7,711,206	30,492,763	4,406,517				
Crook	4,589,554	68,531			1,143,155		
Fremont	4,487,553	28,800,141					
Goshen	18,224						
Hot Springs	7,418,211	219,874	27,345				
Johnson	3,190,077	1,019,428			76,213		
Laramie	465,312	45,711					
Lincoln	576,941	27,734,403	4,011,019				
Natrona	6,673,756	6,337,639			48,598		
Niobrara	1,032,565	558,424					
Park	19,733,945	5,537,299					649,264
Platte							
Sheridan	167,759	6,839	1,346,503				
Sublette	1,383,708	38,840,122					
Sweetwater	7,721,338	61,506,683	12,512,046			11,919,530	
Teton							
Uinta	10,854,215	83,802,227					
Washakie	1,970,579	3,808,714					
Weston	2,152,945	1,615,492			142,444		
TOTAL	111,148,577	352,799,892	128,145,751	- 226,821	1,818,502		1,529,314

			1987 Valuation on 1986 Production					
County	Oil	Gas	Coal	Uranium	Bentonite	Trona	Misc.	Total
Albany	$1,675,390						$356,487	$2,031,877
Big Horn	$45,269,048	$1,136,551			$1,509,942		$885,593	$50,801,134
Campbell	$329,607,858	$49,408,579	$672,929,302				$30,434	$1,051,976,173
Carbon	$31,089,561	$119,961,683	$40,831,102	$17,964,223			$490,370	$210,336,939
Converse	$110,668,772	$32,679,651	$23,163,796	$55,334			$41,613	$166,609,166
Crook	$55,418,904	$19,221			$4,229,675		$76,135	$59,743,935
Fremont	$56,818,617	$78,510,484					$139,359	$135,468,420
Goshen	$257,388						$66,952	$324,340
Hot Springs	$89,068,356	$581,396	$498,499				$40,062	$90,188,313
Johnson	$45,133,203	$1,961,758			$281,988		$26,435	$47,403,384
Laramie	$6,537,822	$54,755					$1,733,032	$8,325,609
Lincoln	$6,315,613	$79,524,015	$78,359,101				$360,782	$164,559,511
Natrona	$96,592,425	$19,403,294			$179,814		$317,106	$116,492,639
Niobrara	$14,886,492	$762,798					$22,264	$15,671,554
Park	$227,322,688	$10,248,213					$736,414	$234,307,315
Platte							$3,519,434	$3,519,434
Sheridan	$2,185,172	$13,276	$29,824,713				$39,656	$32,062,817
Sublette	$18,655,821	$63,704,073					$116,947	$82,476,841
Sweetwater	$109,267,345	$152,475,422	$265,880,468			$105,566,325	$101,697	$633,291,257
Teton							$53,941	$55,941
Uinta	$141,670,574	$272,077,253					$370,030	$414,117,857
Washakie	$25,354,518	$1,698,505					$37,227	$27,090,250
Weston	$30,467,089	$3,667,721			$529,143		$29,579	$34,693,523
TOTAL	$1,440,262,656	$889,888,628	$1,111,486,981	$18,019,557	$6,730,553	$105,566,325	$9,593,529	$3,581,548,229
% of Total	40.2	24.8	31.1	0.5	0.2	2.9	0.3	

			1987 Unit Valuation				
	Oil	Gas	Coal	Uranium	Bentonite	Trona	Gypsum
County	$/bl	$/MCF	$/Ton	$/Ton	$/Ton	$/Ton	$/Ton
Albany	13.86						3.73
Big Horn	11.62	2.16			3.7		3.73
Campbell	13.42	1.85	6.48				
Carbon	12.81	3.5	20.01	79.21			
Converse	14.35	1.07	5.26				
Crook	12.08	0.28			3.7		
Fremont	12.66	2.73					
Goshen	14.12						
Hot Springs	12.01	2.64	18.23				
Johnson	14.15	1.92			3.7		
Laramie	14.05	1.2					
Lincoln	10.95	2.87	19.54				
Natrona	14.47	3.06			3.7		
Niobrara	14.42	1.37					
Park	11.32	1.85					3.73
Platte							
Sheridan	13.03	1.94	22.15				
Sublette	13.48	1.64					
Sweetwater	14.15	2.48	21.25			8.86	
Teton							
Uinta	13.05	3.25					
Washakie	12.87	0.45					
Weston	14.15	2.27			3.7		
State Average	12.96	2.52	8.67	79.21	3.7	8.86	3.73
Increase or							
Decrease	-10.51	-0.49	-1.63	48.24	0.42	-0.08	0.48
Over 1986							

			1987 Production				
	Oil	Gas	Coal	Uranium	Bentonite	Trona	Gypsum
County	(Bbls)	(MCF)	(Tons)	(Tons)	(Tons)	(Tons)	(Tons)
Albany	116,973						3,775
Big Horn	4,098,535	1,534,150			342,769		185,818
Campbell	26,861,409	29,837,276	110,153,389				
Carbon	2,971,071	44,922,065	2,162,477	94,795			
Converse	6,950,103	21,454,649	4,436,159	40,730			
Crook	4,656,405	69,922			1,414,532		
Fremont	4,806,517	38,765,119		100,349			
Goshen	12,841						
Hot Springs	7,470,631	230,383	10,227				
Johnson	3,131,029	1,379,407		8,213	99,615		
Laramie	435,421	2,313					
Lincoln	633,587	32,176,044	4,215,533				
Natrona	6,300,511	7,463,044			10,718		
Niobrara	917,783	606,561					
Park	20,099,143	8,647,895					165,073
Platte							
Sheridan	153,546		1,180,781				
Sublette	1,197,534	38,660,921					
Sweetwater	7,675,368	61,813,951	10,507,255			12,422,255	
Teton							
Uinta	10,507,255	113,219,173					
Washakie	2,024,187	3,451,992			18,186		
Weston	1,961,565	1,627,957			220,361		
TOTAL	112,981,314	407,862,822	132,753,011	244,087	2,159,077	12,422,255	354,666

				1988 Valuation on 1987 Production				
County	Oil	Gas	Coal	Uranium	Bentonite	Trona	Misc	Total
Albany	$1,846,769						$393,033	$2,239,802
Big Horn	$58,691,199	$2,698,040			$1,327,430		$738,058	$63,305,227
Campbell	$421,905,618	$41,604,238	$657,613,326				$4,911	$1,121,128,093
Carbon	$45,292,016	$120,068,003	$37,368,663	$3,700,797			$129,048	$206,558,527
Converse	$112,823,858	$27,103,884	$17,102,688	$80,608			$114,830	$157,227,868
Crook	$69,050,501	$18,604			$5,686,440		$141,221	$74,896,766
Fremont	$66,862,480	$70,153,542		$2,764,045			$110,962	$139,891,029
Goshen	$225,585						$32,120	$237,705
Hot Springs	$110,023,854	$621,526	$128,451				$239,990	$111,013,821
Johnson	$48,992,186	$2,172,076		$4,607	$400,454		$80,669	$51,649,992
Laramie	$7,356,058	$578					$3,254,020	$10,615,656
Lincoln	$7,600,974	$53,057,684	$73,990,766				$51,205	$134,700,629
Natrona	$103,387,382	$19,662,777			$43,085		$311,500	$123,404,824
Niobrara	$14,557,357	$610,155					$53,674	$15,221,186
Park	$277,461,908	$12,763,291					$761,279	$290,986,478
Platte							$1,176,232	$1,176,232
Sheridan	$2,561,252		$24,939,341				$17,309	$27,517,902
Sublette	$18,754,210	$49,125,122					$42,876	$67,922,208
Sweetwater	$130,096,052	$130,096,052	$195,086,366			$114,546,971	$58,999	$552,955,671
Teton							$120,154	$120,154
Uinta	$167,065,232	$200,261,783					$100,427	$367,437,442
Washakie	$29,323,253	$1,533,668			$73,106		$23,178	$30,975,205
Weston	$32,179,084	$3,027,677			$885,853		$58,241	$36,150,855
TOTAL	$1,726,036,828	$717,673,951	$1,006,229,601	$6,550,057	$8,677,541	$114,546,971	$7,804,343	$3,587,543,292
% of Total	48	20	28	0.2	0.4	3	0.4	

			1988 Unit Valuation				
	Oil	Gas	Coal	Uranium	Bentonite	Trona	Gypsum
County	$/bl	MCF	$/Ton	$/Ton	$/Ton	$/Ton	$/Ton
Albany	15.79						1.92
Big Horn	14.32	1.76			4.02		3.8
Campbell	15.71	1.39	5.97				
Carbon	15.24	2.67	17.28	39.04			
Converse	16.23	1.26	3.86	1.98			
Crook	14.83	0.27			4.02		
Fremont	13.91	1.81		27.54			
Goshen	17.57						
Hot Springs	14.73	2.71	12.56				
Johnson	15.65	1.57		0.56	4.02		
Laramie	16.89	0.25					
Lincoln	12.01	1.65	17.55				
Natrona	16.41	2.63					
Niobrara	15.86	1.01					
Park	13.81	1.48					
Platte							3.8
Sheridan	16.68		21.13				
Sublette	15.66	1.27					
Sweetwater	16.95	1.83	18.42			9.22	
Teton							
Uinta	15.9	1.74					
Washakie	14.49	0.45			4.02		
Weston	16.4	1.86			4.02		
State Average	15.28	1.76	7.58	26.83	4.02	9.22	3.78
+ or -							
over 1988	2.32	-0.76	-1.09	-52.37	0.32	0.36	0.05

1988 Production

COUNTY	OIL (Bbls)	Gas(MCF)	Coal(Tons)	Uranium(Tons)	Bentonite (Tons)	Trona (Tons)	Gypsum(Tons)
Albany	93,583						7,969
Big Horn	3,805,607	1,541,212			777,922		202,950
Campbell	25,263,437	22,434,188	136,002,378				
Carbon	2,960,509	37,567,726	3,986,366	191,776			
Converse	5,293,667	14,487,398	5,795,596	954,871			
Crook	4,532,719	95,946			1,128,446		
Fremont	4,042,325	30,924,030		90,821			
Goshen	11,621						
Hot Springs	6,640,726	220,978	50,881		50,535		
Johnson	2,495,553	897,926		204,655	174,008		
Laramie	397,459						
Lincoln	527,879	38,287,272	4,895,729				
Natrona	6,463,837	7,682,362			9,658		
Niobrara	778,556	643,193					
Park	18,629,663	8,307,978			2,048		144,264
Platte							
Sheridan	144,383		944,816				
Sublette	993,984	41,128,147					
Sweetwater	7,279,722	89,355,944	12,125,608			15,114,169	
Teton							
Uinta	10,053,851	173,382,102					
Washakie	1,794,604	3,072,300			54,119		
Weston	1,696,490	1,335,222			131,446		
TOTALS	111,207,959	471,363,924	163,801,374	1,442,123	2,328,182	15,114,169	355,183

1989 Valuation on 1988 Production

COUNTY	Oil	Gas	Coal	Uranium	Bentonite	Trona	Misc.	Total
Albany	$1,331,350						$933,671	$2,265,021
Big Horn	$45,218,708	$2,998,095			$3,131,124		$1,548,940	$52,896,867
Campbell	$342,843,970	$30,975,798	$744,292,453					$1,118,112,221
Carbon	$39,170,880	$102,639,470	$66,965,930	$4,076,703			$35,500	$212,888,483
Converse	$79,762,355	$22,036,632	$28,260,618	$12,118,299			$309,300	$142,451,704
Crook	$55,974,336	$48,201			$8,644,202		$335,561	$65,002,800
Fremont	$50,303,565	$55,079,435		$1,898,243			$276,697	$107,557,940
Goshen	$171,844						$253,058	$424,902
Hot Springs	$82,065,553	$680,027	$602,750		$151,605		$47,270	$83,547,205
Johnson	$35,176,547	$1,456,453			$933,255		$281,163	$39,274,024
Laramie	$5,940,949						$3,464,288	$9,405,237
Lincoln	$7,014,484	$49,283,967	$85,631,048				$78,472	$142,007,971
Natrona	$94,962,425	$19,593,727			$42,870		$616,748	$115,215,770
Niobrara	$11,415,651	$702,781					$28,176	$12,146,608
Park	$220,030,378	$11,612,786			$10,383		$1,242,654	$232,896,201
Platte							$646,207	$646,207
Sheridan	$2,145,779		$24,243,307				$140,295	$26,529,381
Sublette	$14,604,970	$61,294,407					$19,186	$75,918,563
Sweetwater	$105,521,923	$161,785,807	$220,710,110			$116,918,544	$151,084	$605,087,468
Teton							$255,273	$255,273
Uinta	$144,651,012	$194,771,680					$478,194	$339,925,156
Washakie	$22,731,686	$2,048,275			$117,126		$51,985	$24,949,072
Weston	$25,572,027	$2,582,112			$673,004		$162,754	$28,989,897
TOTALS	$1,386,610,392	$719,589,653	$1,154,653,129	$19,519,851	$13,703,569	$116,918,544	$27,398,833	$3,438,393,971
% of Total	40	21	34	0.5	0.5	3	1	

1989 Unit Valuation

	Oil	Gas	Coal	Uranium	Bentonite	Trona	Gypsum
County	$/bl	MCF	$/Ton	$/Ton	$/Ton	$/Ton	$/Ton
Albany	$14.23						$4.79
Big Horn	$11.89	$1.95			$4.03		$7.29
Campbell	$13.57	$1.38	$5.48				
Carbon	$13.24	$2.74	$17.45	$21.26			
Converse	$15.07	$1.53	$4.88	$12.76			
Crook	$12.35	$0.51			$7.66		
Fremont	$12.45	$1.79		$20.90			
Goshen	$14.79						
Hot Springs	$12.36	$3.08	$11.85				
Johnson	$14.10	$1.63		$6.97	$3.00		
Laramie	$14.95				$5.37		
Lincoln	$13.29	$1.29	$17.49				
Natrona	$14.70	$2.55			$4.44		
Niobrara	$14.67	$1.10					
Park	$11.81	$1.40			$5.07		$7.43
Platte							
Sheridan	$14.87		$25.66				
Sublette	$14.70	$1.49					
Sweetwater	$14.50	$1.81	$18.21			$7.74	
Teton							
Uinta	$14.39	$1.13					
Washakie	$12.67	$0.67			$2.17		
Weston	$15.08	$1.94			$5.12		
State Average	$13.35	$1.53	$7.10	$13.54	$5.89	$7.74	$7.29
+ or -							
over 1988	Minus 1.93	Minus 0.23	Minus $0.48	Minus 13.29	Minus 0.13	Minus 1.48	Plus 2.51

1989 Production

COUNTY	OIL (Bbls)	Gas(MCF)	Coal(Tons)	Uranium(Tons)	Bentonite (Tons)	Trona (Tons)	Gypsum(Tons)
Albany	95,109						22,228
Big Horn	3,751,252	2,374,029			957,790		228,813
Campbell	25,461,488	19,836,778	143,944,898				
Carbon	3.043,052	40,550,983	4,279,323	466,641			
Converse	5,303,473	18,348,585	6,116,368	765,164			
Crook	4,702,150	121,570			905,101		
Fremont	3,469,465	37,125,681		238			
Goshen	9,935						
Hot Springs	6,683,978	216,969	52,149		1,257		
Johnson	2,324,334	1,173,611		308,369	155,112		
Laramie	375,811	93,721					
Lincoln	495,384	30,814,135	4,776,375				
Natrona	6,244,638	7,500,893			12,398		
Niobrara	838,504	653,487					
Park	16,954,943	6,907,406			1,851		148,253
Platte							
Sheridan	126,735		111,293				
Sublette	986,238	157,496,744					
Sweetwater	6,839,260	107,808,383	11,758,163			16,212,715	
Teton							
Uinta	9,593,687	186,097,544					
Washakie	1,641,984	2,910,640			36,482		
Weston	1,412,960	1,472,979			141,261		
TOTALS	100,354,382	621,502,138	171,038,369	1,504,412	2,211,252	16,212,715	399,294

1990 Valuation on 1989 Production

County	Oil	Gas	Coal	Uranium	Bentonite	Trona	Misc.	Total
Albany	$1,621,388						$1,187,783	$2,809,171
Big Horn	$56,265,155	$3,367,096			$3,445,058		$1,284,783	$64,361,878
Campbell	$428,849,703	$26,106,590	$776,834,554				$10,418	$1,231,796,265
Carbon	$44,236,572	$88,376,373	$56,711,810	$8,867,256			$26,910	$198,218,921
Converse	$97,323,719	$18,615,537	$24,178,459	$7,519,308			$370,143	$148,007,166
Crook	$71,209,617	$74,789			$4,960,148		$42,837	$76,287,391
Fremont	$55,600,876	$74,898,411		$2,484			$86,788	$130,588,559
Goshen	$179,119						$88,433	$267,552
Hot Springs	$93,077,391	$699,797	$633,132		$5,365		$32,918	$94,448,503
Johnson	$39,688,254	$1,601,332		$1,351,504	$1,008,601		$56,192	$43,705,883
Laramie	$6,929,428	$65,107					$2,178,993	$9,173,528
Lincoln	$8,734,111	$39,599,866	$87,857,696				$46,194	$136,237,867
Natrona	$109,881,562	$19,521,256			$81,586		$521,303	$130,005,707
Niobrara	$15,012,962	$828,323					$2,194	$15,843,479
Park	$247,176,755	$10,476,015			$7,428		$1,032,740	$258,692,938
Platte							$618,098	$618,098
Sheridan	$2,335,292		$1,551,907				$65,166	$3,952,365
Sublette	$19,358,349	$108,242,786					$7,516	$127,608,651
Sweetwater	$124,597,170	$184,231,443	$209,524,666			$150,600,216	$107,262	$668,964,838
Teton							$365,932	$365,932
Uinta	$182,862,832	$188,799,075					$122,172	$371,784,079
Washakie	$25,920,875	$2,844,834			$83,818		$37,494	$28,887,021
Weston	$26,739,914	$2,860,378			$587,702		$530	$30,188,524
TOTAL	$1,657,596,044	$771,209,008	$1,157,292,224	$17,740,552	$10,179,606	$150,600,216	$8,196,666	$3,772,814,316
% ot Total	44	20	31	0.5	0.2	4	0.3	
				*Includes In-situ				

1990 Unit Valuation

	Oil	Gas	Coal	Uranium	Bentonite	Trona	Gypsum
County	$/Bl	$/MCF	$/Ton	$/Ton	$/Ton	$/Ton	$/Ton
Albany	17.05						5.53
Big Horn	15	1.42			3.6		5.17
Campbell	16.84	1.32	5.4				
Carbon	14.54	2.18	13.25	19			
Converse	18.35	1.01	3.95	9.83			
Crook	15.14	0.61			5.48		
Fremont	16.03	2.02		10.44			
Goshen	18.03						
Hot Springs	13.93	3.23	12.14		4.19		
Johnson	17.08	1.36		4.38	6.5		
Laramie	18.44	0.69					
Lincoln	17.63	1.29	18.39				
Natrona	17.6	2.6			6.58		
Niobrara	17.9	1.27					
Park	14.58	1.52			4.01		5.87
Platte							
Sheridan	18.43		13.94				
Sublette	19.63	0.69					
Sweetwater	18.22	1.71	17.82			9.29	
Teton							
Uinta	19.06	1.01					
Washakie	15.79	0.98			2.3		
Weston	18.92	1.94			4.16		
State Average	16.52	1.24	6.77	11.52	4.6	9.29	5.45
Plus or Minus	Plus 3.17	Minus .29	Minus.33	Minus 2.02	Minus 1.29	Plus 1.55	Minus 1.84
1989							

WYOMING MINERAL PRODUCTION ESTIMATES
1990-1994

1990 Production

County	Oil (bls)	Gas (MCF)	Coal (Tons)	Uranium (Tons)	Bentonite (Tons	Trona (Tons)	Gypsum (Tons)
Albany	100000						5000
Big Horn	3000000	2500000			1000000		215000
Campbell	24000000	28000000	132000000				
Carbon	2000000	45000000	2000000				
Converse	5000000	1 8,000,000	8400000	125000			
Crook	4000000				1455000		
Fremont	4000000	41000000		50000			
Goshen							
Hot Springs	7000000	2300000	100000		70000		
Johnson	2000000	1000000			200000		
Laramie	250000						
Lincoln	500000	57000000	4450000				
Natrona	6000000	10000000			15000		
Niobrara	500000	1000000					
Park	15750000	100000001			10000		140000
Platte							
Sheridan			500000				
Sublette	2000000	75000000					
Sweetwater	10000000	110000000	9000000			15200000	
Teton							
Uinta	12000000	235000000					
Washakie	1300000	5000000					
Weston	1000000	1500000					
TOTALS	100400000	642300000	156450000	175000	2750000	15200000	360000

			1991 Production				
COUNTY	OIL (Bbls)	Gas(MCF)	Coal(Tons)	Uranium(Tons)	Bentonite (Tons)	Trona (Tons)	Gypsum(Tons)
Albany	100,000						5,000
Big Horn	3,000,000	3,000,000			1,100,000		215,000
Campbell	22,000,000	28,000,000	136,000,000				
Carbon	2,000,000	45,000,000	2,500,000				
Converse	5,000,000	18,000,000	10,000,000	100,000			
Crook	3,500,000				1,585,000		
Fremont	3,500,000	45,000,000		50,000			
Goshen							
Hot Springs	7,000,000	2,800,000	250,000		80,000		
Johnson	2,000,000	1,000,000			200,000		
Laramie	250,000						
Lincoln	500,000	60,000,000	4,200,000				
Natrona	5,000,000	10,000,000			20,000		
Niobrara	500,000	1,000,000					
Park	16,450,000	11,000,000			15,000		140,000
Platte							
Sheridan			500,000				
Sublette	2,200,000	78,000,000					
Sweetwater	8,000,000	112,000,000	10,500,000			16,000,000	
Teton							
Uinta	12,000,000	239,000,000					
Washakie	1,300,000	6,000,000					
Weston	1,000,000	1,500,000					
TOTALS	95,300,000	661,300,000	163,950,000	150,000	3,000,000	16,000,000	360,000

			1992 Production				
COUNTY	OIL (Bbls)	Gas(MCF)	Coal(Tons)	Uranium(Tons)	Bentonite (Tons)	Trona (Tons)	Gypsum(Tons)
Albany	100,000						7,000
Big Horn	2,500,000	3,000,000			1,180,000		218,000
Campbell	20,400,000	28,000,000	138,000,000				
Carbon	2,000,000	44,800,000	2,500,000				
Converse	4,500,000		11,000,000	87,500			
Crook	3,000,000				1,700,000		
Fremont	3,500,000	48,000,000		50,000			
Goshen							
Hot Springs	7,000,000	2,800,000	250,000		85,000		
Johnson	2,000,000	1,000,000			250,000		
Laramie	250,000						
Lincoln	500,000	65,000,000	5,650,000				
Natrona	4,500,000	10,000,000			20,000		
Niobrara	500,000	1,000,000					
Park	15,450,000	11,000,000			15,000		150,000
Platte							
Sheridan			500,000				
Sublette	2,500,000	85,000,000					
Sweetwater	7,000,000	121,000,000	12,000,000			16,000,000	
Teton							
Uinta	12,600,000	251,000,000					
Washakie	1,300,000	8,000,000					
Weston	1,000,000	1,500,000					
TOTALS	90,600,000	681,100,000	169,900,000	137,500	3,250,000	16,000,000	375,000

			1993 Production				
COUNTY	OIL (Bbls)	Gas(MCF)	Coal(Tons)	Uranium(Tons)	Bentonite (Tons)	Trona (Tons)	Gypsum(Tons)
Albany	1,000,000						7,000
Big Horn	2,000,000	3,000,000			1,150,000		218,000
Campbell	19,400,000	29,000,000	140,000,000				
Carbon	2,000,000	44,800,000	3,000,000				
Converse	4,500,000	20,000,000	13,000,000	85,000			
Crook	3,000,000				1,700,000		
Fremont	3,500,000	50,000,000		40,000			
Goshen							
Hot Springs	7,000,000	3,200,000	250,000		85,000		
Johnson	2,000,000	1,000,000			250,000		
Laramie	250,000						
Lincoln	500,000	65,000,000	5,350,000				
Natrona	4,000,000	10,000,000			50,000		
Niobrara	500,000	1,000,000					
Park	13,450,000	11,000,000			15,000		150,000
Platte							
Sheridan			500,000				
Sublette	1,500,000	83,000,000					
Sweetwater	6,800,000	118,000,000	11,000,000			16,500,000	
Teton							
Uinta	12,300,000	252,000,000					
Washakie	1,300,000	9,000,000					
Weston	1,000,000	1,500,000					
TOTALS	86,000,000	701,500,000	173,100,000	125,000	3,250,000	16,500,000	375,000

1994 Production

COUNTY	Oil (Bbls)	Gas(MCF)	Coal(Tons)	Uranium(Tons)	Bentonite (Tons)	Trona (Tons)	Gypsum(Tons)
Albany	650,000						8,000
Big Horn	1,200,000	2,000,000			1,175,000		225,000
Campbell	12,500,000	19,000,000	146,800,000	10,000			
Carbon	1,200,000	30,000,000	3,000,000				
Converse	2,300,000	14,000,000	15,000,000	95,000			
Crook	2,000,000				1,730,000		
Fremont	2,300,000	34,800,000		45,000			
Goshen							
Hot Springs	4,000,000	2,200,000	250,000		100,000		
Johnson	1,200,000	700,000			270,000		
Laramie	350,000						
Lincoln	2,400,000	45,000,000	5,350,000				
Natrona	2,400,000	7,000,000			60,000		
Niobrara	300,000	700,000					
Park	9,700,000	7,200,000			15,000		157,000
Platte							
Sheridan			500,000				
Sublette	1,500,000	70,000,000					
Sweetwater	4,350,000	82,500,000	11,000,000			20,000,000	
Teton							
Uinta	7,500,000	185,000,000					
Washakie	800,000	6,000,000					
Weston	650,000	900,000					
TOTALS	57,300,000	507,000,000	181,900,000	150,000	3,350,000	20,000,000	390,000

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